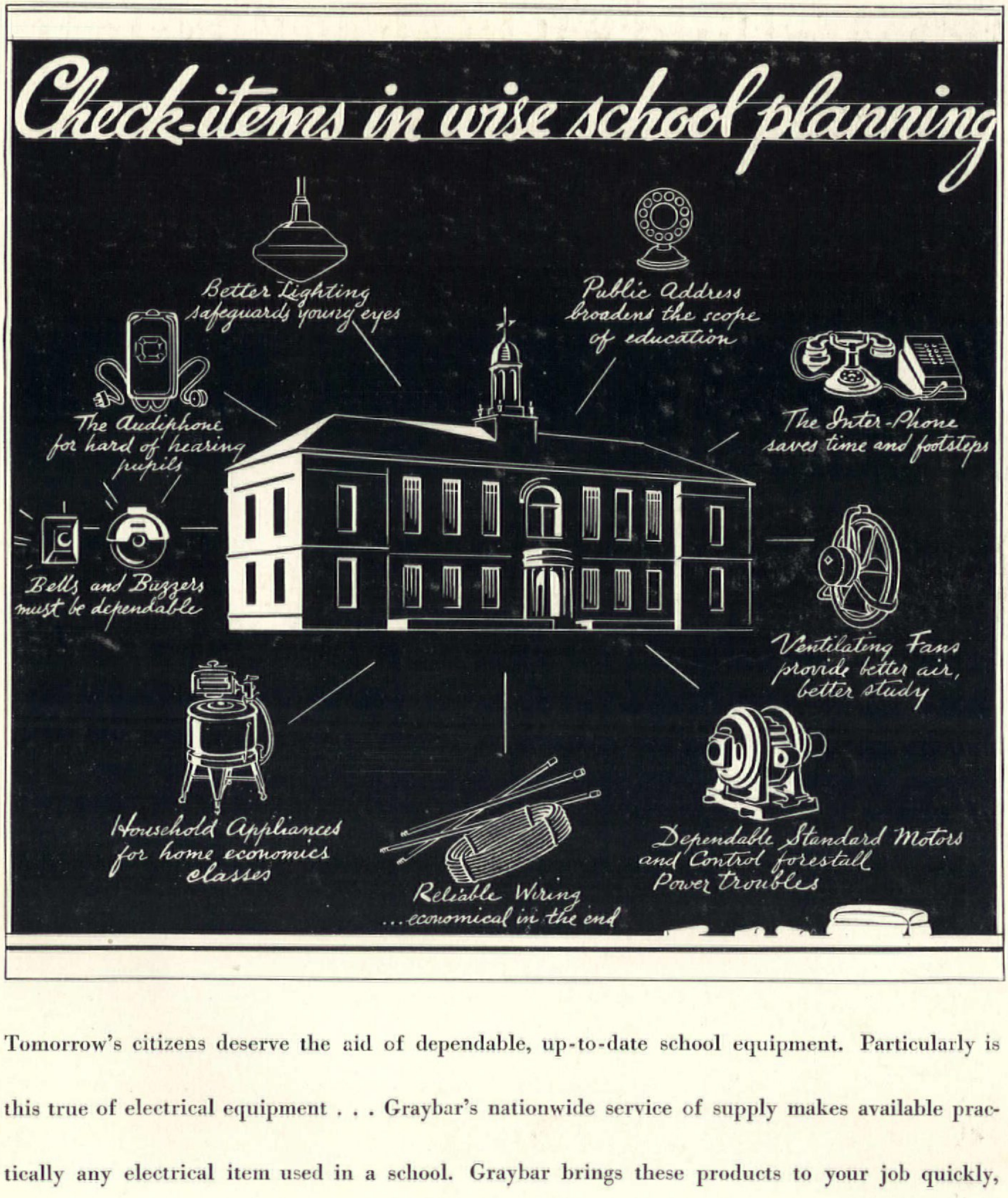
THE ARCHITECTURAL FORUM

3526

INCLUDING "BUILDING MONEY"

JANUARY, 1935

SCHOOL REFERENCE NUMBER



THE ARCHITECTURAL FORUM

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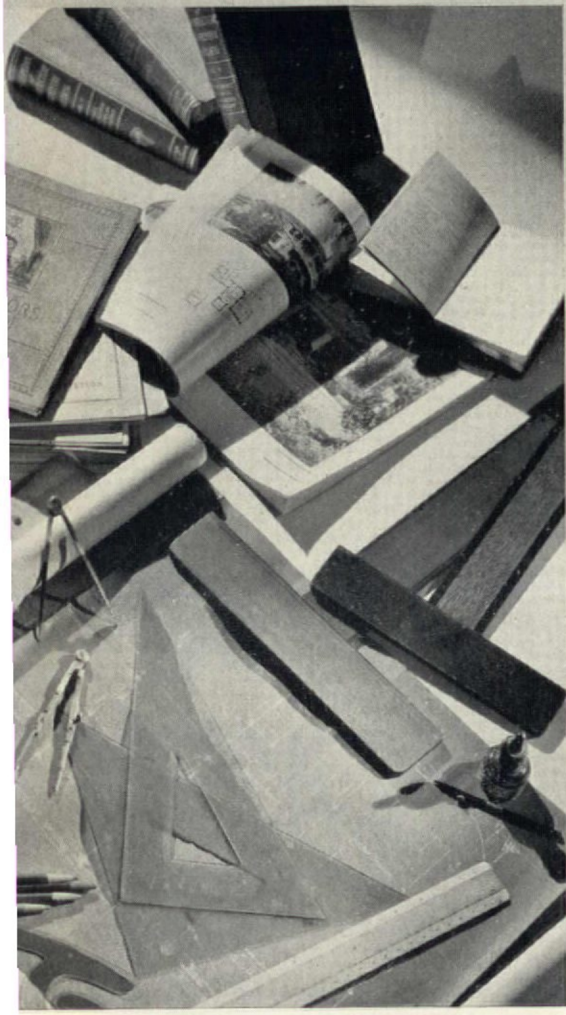
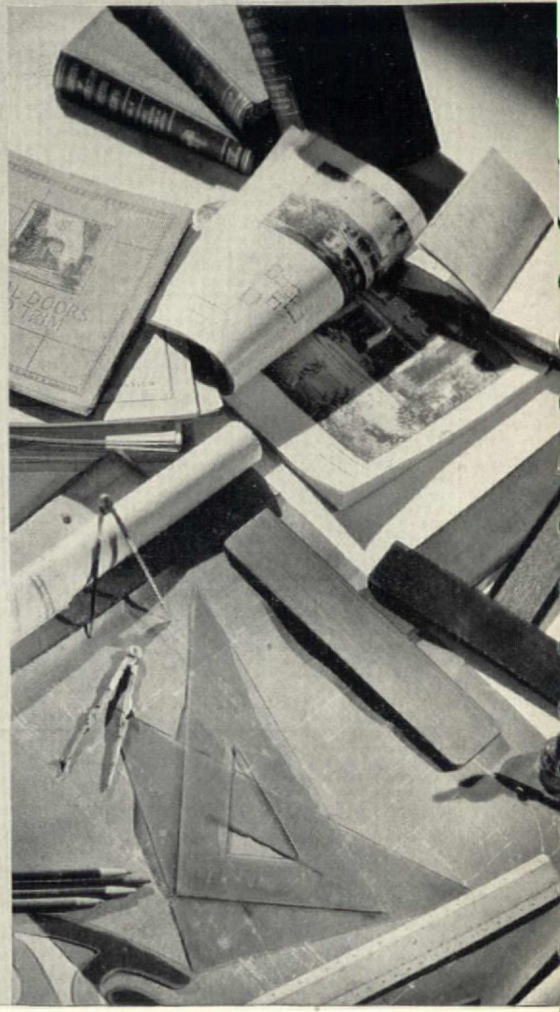
VOLUME LXII
Number 1

HERE IS A VERY PRACTICAL DEMONSTRATION

of the SUPERIOR QUALITY of L·O·F Quality Window Glass

★ ★





A SELECTION of articles commonly found in an architect's office was strewn about on a table-top; a large piece of L·O·F Quality Window Glass, securely clamped in a wooden frame, was suspended over them; a photograph was taken AT AN ANGLE, looking down THROUGH the glass at the table-top. The frame holding the glass was then removed and a second photograph was taken with NOTHING between the lense and the articles on the table. The two photographs are herewith reproduced. Despite the acute angle at which they were taken, the many straight lines are so faithfully reproduced *through the glass,* that it is practically impossible to tell which picture is which.

Hardly a technical or scientific test, it is true, but sufficiently convincing to explain, in some measure, why so many architects write a closed specification for this fine window glass. For your protection, instruct contractors and builders to leave the labels on until final inspection has been made. Libbey·Owens·Ford Glass Company, Toledo, Ohio.

★

The authenticity of these photographs is attested by Underwood & Underwood.

LIBBEY·OWENS·FORD
QUALITY GLASS

L O F

IF . . .

The modern vehicular tunnel presents one of the most difficult of ventilation problems. Through the use of ventilating equipment of utmost efficiency and dependability the problem has been solved. IF it were not for such equipment, the alternative would be: gas masks or no tunnels.

THE largest subterranean vehicular tunnel in the world will be California's new Broadway low-level vehicular tunnel when completed. 16 giant Sturtevant Fans... capable of handling 139 tons of air per minute... will ventilate it. ¶ Other Sturtevant-ventilated vehicular tunnels are the Holland Tunnels between New York and New Jersey, the Detroit-Canada Tunnel, and the Alameda Tunnel in San Francisco.

B. F. Sturtevant Company, Hyde Park, Boston, Mass.

Sturtevant

VENTILATING · HEATING · AIR CONDITIONING EQUIPMENT

LETTERS

F.H.A. Mortgage Transfers

Forum:

. . . We are very much interested indeed in the Housing Act. We do not believe that private capital will subscribe to the organization of mortgage loan companies as provided in the Housing Act for an amount sufficient to serve the country adequately, and even if we were surprised at the amount of private capital so subscribed we do not believe the bonds that they are permitted to issue at 3 per cent would sell at par, which would defeat the purpose of the act.

We are endeavoring to induce our Congressmen and Senators to offer an amendment to the act authorizing National Banks to engage in this mortgage loan business on the terms set out in this act with this thought in mind — the banks now have an almost inexhaustible supply of idle cash in their vaults, which is practically earning them nothing. This would open up to them an unlimited volume of 5 per cent paper. Such paper must be eligible at the Federal Reserve for rediscount upon the same terms as other Government securities. Banks can not invest their money in frozen assets such as 20 year paper, but I am relying entirely upon the perfect and absolute safety of the insurance which the act provides. Insurance is not a speculation but an absolute protection — it is actuarial certainty and not guesswork, therefore all insured paper should be so liquid as to enable the banks to buy it with complete safety. They could issue 3 per cent bonds against it to repay the Federal Reserve. This would make available to the public immediate funds to refinance their paper, or for new building construction in every village in the United States.

Slum eradication and other local building measures designed principally for relief are confined to only a few isolated sections and while good in themselves are too small for any general effect on building.

My theory is that the insurance of mortgage loan paper fills a very long felt want and is a tremendous advance in the system of mortgage loans, and in stabilizing real estate. It is of such great advantage that it should not be allowed to fail.

I understand that England and Sweden have National Mortgage Laws which are extremely beneficial, and I would be greatly interested in having you publish a résumé of the laws of those two countries on this subject.

We anticipate that there will be a demand in the next Congress for an amendment to this Act having the Government issue these bonds. It is vastly preferable that the banks handle it, as bureaucratic Government is always unsatisfactory and the Government should keep out of every class of business it is possible to avoid.

Please answer me specifically — does the present act enable the private mortgage holder to secure insurance and does that insurance follow with the transfer of the mortgage note to any buyer? The Administrator has ruled in regard to a local retail lumber company who desires to make loans for building purposes that it is not eligible for insurance and that if insured, the insurance would not pass to private investor to whom he might sell the note. We see nothing in the act authorizing such a ruling.

F. L. Hillyer, *President*
Hillyer-Deutsch-Jarratt Company
San Antonio, Texas

England and Sweden's mortgage laws were studied closely in framing the National Housing Act, the best features of each retained or modified.

Insurance does not follow the transfer from one mortgagee to another unless the second mortgagee has been approved by the Housing Administration. Efforts are being made to change this ruling.—Ed.

Beaux Arts Please Note

Forum:

In a recent examination for Architectural Renderer held by the Municipal Civil Service Commission of the City of New York, there were 53 candidates, of which only seven passed. All but two of those who passed were educated either entirely or in part abroad. The candidate with the highest rating is Theodore Kautsky, who was born in Budapest, Hungary, and educated in the schools of Budapest and the Royal University of Hungary. This candidate was given 100 per cent on his technical examination, which consisted of making a perspective drawing from blueprint plans of one of the lift spans of the Triborough Bridge and rendering same in pen and ink.

KAUTSKY'S DRAWING

Examiners gave this 100 per cent rating

The candidate with the second highest rating is Nicholas B. Vassilieve, who was born in St. Petersburg, Russia, and educated in the St. Petersburg's High School and Institute of Civil Engineering.

The third highest candidate is Allen G. Lorimer, who was born in Monifieth, Scotland, and educated in the Harris Academy of Dundee, Scotland, the University of St. Andrews, Scotland, and the Glasgow School of Architecture.

The fourth on the list is Michael L. Radoslovich, who obtained his elementary and technical training in Austria, but who later attended the Massachusetts Institute of Technology to obtain his master's degree in Architecture.

The fifth on the list is Carl E. Bierschank, who was educated entirely in the United States.

The sixth on the list is Angelo DeSousa, who was born in Hongkong, China, where he received his elementary education. His high school and architectural training were obtained in the United States.

The seventh on the list is Arthur Deimel, who was born in Austria, Hungary, but obtained his entire education in the United States.

The examination was very practical, being exactly the same as that which the Architectural Renderers will have to do when appointed to the two vacancies in the Triborough Bridge Authority. The examiners were Lawrence Grant White, architect and member of the firm of McKim, Mead & White, New York, and Sidney Wood Mosher, Examiner, representing the Municipal Civil Service Commission of the City of New York.

Sidney Wood Mosher
New York, N. Y.

Housing Exhausted

Forum:

. . . . I hope you will publish more of the Colonial measured drawings that you printed in September.

The various architectural magazines have exhausted the subject of housing and until some projects are completed I hope that the topic will be dropped. I subscribe to five architectural magazines and you will realize how boring the same material becomes when repeated in only slightly altered form so many times.

The present is a time for study, travel being out of question for most and books prohibitive in price; it is up to the magazines to give new thoughts. One can always do better modern with a firm knowledge of the past.

Your article on Carl Milles should be of great interest and inspiration to many and prove that there is an architectural importance to all arts and that they have a place in an architectural magazine.

Kenneth L. Peterson
Melrose, Mass.

Take It or Levitt

Forum:

Is one to believe that The Architectural Forum is in accord with the practices of Levitt & Sons as described in your November issue? Surely this cannot be so, for in the issue of May, the practices of Mr. Walsh, who is a registered architect, are condemned as it lowers the dignity of the architectural profession for architects to act as

(Continued on page 6)

LETTERS
(Continued)

builders; yet Levitt & Sons who are not registered architects are commended; yet here are builders acting as architects. Is this in accordance with the standards of the A.I.A.? Why in heaven's name isn't Levitt condemned along with Walsh?

If the Levitt article had appeared in "Homes by Builders" or "Jerry-Built Houses" there would be some justification for such an article, but appearing in your publication it does not seem to be consistent and does architects a grave injustice. Practices such as the Levitts' are not very praiseworthy when you consider only one phase of their business, that being the elimination of the legitimate architectural fee and services.

If it is your ultimate idea to praise builders, I am sure that there are many prominent builders who work with architects in the A.I.A. procedure who would appreciate this form of commendation.

CHARLES F. DEHM, Jr.

Tuckahoe, N. Y.

THE ARCHITECTURAL FORUM'S attitude toward both the Levitts and Professor Walsh is one of neither praise nor blame. Their activities were presented as being of interest, not as models to follow.—ED.

Milles

Forum:

I wish to thank you for the excellent article about Mr. Milles and his work in this month's FORUM. It was deeply appreciated by everyone at Cranbrook. An architectural magazine is certainly the place to show sculpture of this character, rather than the so-called art magazines for, after all, it is but one phase of architecture. . . .

RICHARD P. RASEMAN

Bloomfield Hills, Mich.

French's Fee

Forum:

When I read of the Fred F. French Knickerbocker Village job in this month's issue, I was almost tempted to shed tears at his losses as stated. I was cheered up, however, by reading the tabulations at the end of the article. These tabulations indicated a builder's fee of $450,000. I'd like to venture it was the only builder's fee of that size earned last year by any building organization. To the fee should be added the glory of having earned it in the humanizing cause of eradicating the slums.

It has long been accepted by those who are interested in low rental priced housing that Knickerbocker Village is not a slum clearance job. It is a sad commentary on the efforts of our government agencies that this, the most important of the housing schemes completed thus far under their sponsorship, should have been brought about to save the precarious speculative position of a risky land gamble. And a gamble it was in 1929 to assemble the East Side land at the figures paid. Others who bought land then did not find a Maecenas in the form of Uncle Sam to buy for cash their gamblers' stocks at full two-thirds of the prices paid. In addition to being relieved of the land burden, to be rewarded further with a handsome builder's fee and architectural fees and a management contract, and possession with a long term government loan, at low interest, and the benefit of twenty-year tax exemption, opened up the gates to a builder's paradise. If the Government wants any more deals like this, all the speculative builders in the country will form a queue all around the new Washington palaces.

If a project like this would be properly labeled, it should be called a subsidized job for the benefit of a smart and lucky organization, and for the benefit of those who rent and live there and who evade their share of taxes, at the expense of the poor fish who live in unsubsidized bunks.

JACOB MARK

Brooklyn, N. Y.

Astonished Neighbors

Forum:

It would be strange indeed if an architect were not permitted to build his caprices into his own house; and he must be a dull critic who would demand a rational defense of such caprices.

The interiors of the house at 211 East 48th Street [House of William Lescaze, THE ARCHITECTURAL FORUM Dec., 1934, pp. 389–398] seem to me to be altogether delightful. They are full of wit and of intriguing fantasies. The expression of a personality runs through them like a golden thread and unites them into a subtle harmony. This must be a charming house to live in or to visit.

I am not so well pleased with the façade. It asserts somewhat too stridently the creed of Corbusier — as if determined at all costs to astonish its brownstone Victorian neighbors. They are not amused.

JOSEPH HUDNUT, *Dean*

Columbia University
New York, N. Y.

What Is a Room?

Forum:

In none of the discussions of housing schemes appearing in THE FORUM or in other architectural magazines, as far as I have been able to discover, has there been any statement as to the method of counting rooms. The method of counting, of course, has a very definite bearing upon the cost per month per room, and for the comparison of rentals in different schemes from different parts of the country I believe that a standard method should be adopted.

Some time ago while in Washington I discussed this with the then existing Housing Board and was told that its only suggestion was to make the count on a basis customary to the locality in which the project was situated.

From a study of the isometric drawing published with your article on Knickerbocker Village appearing in the December issue it would appear that the count was made on the following basis: living room, one, kitchenette, one, and bathroom one-half; total two and one-half rooms. Our practice would be to count this combination as one room, certainly not more than one and one-half, making the Knickerbocker Village count 40 per cent more than our count for such a combination.

If such differences occur in various parts of the country, it is obviously impossible to make fair comparisons of rental per room per month.

HENRY C. ROBBINS

Boston, Mass.

In New York it has been customary to figure a bathroom as one-half room in limited rental buildings. At other times dining alcoves are so counted. Kitchen is always counted as a full room or as none at all if a kitchenette without window. —ED.

Forum's Prize Winner

Forum:

I wish to thank you on behalf of Mr. Roberto and myself for your kind letter and for the check. We feel that your excellent magazine achieves a twofold purpose in sponsoring these remodeling competitions. On the one hand it will encourage people to do away with old-fashioned and illogical conditions in their homes and on the other hand it will serve as an incentive for those of our profession, who are finding too few opportunities from outside sources, to apply their talents in the solutions of these timely problems.

Your comment on the high quality of the designs submitted is an additional source of satisfaction to us at having won first award. We are looking forward with interest to the announcement of the next competition.

MARTIN ELKIND

New York, N. Y.

Penthouse—1934

Forum:

Will you please give a 1934 definition of penthouse, fine points and details? We understand the general idea, but it differs from Shakespeare's use of the word, and the dictionary definition.

We enjoy your magazine very much in the wilds of Montana.

ERIN JANZIG

Helena, Mont.

Penthouse is, in New York, any structure built above the legal roof level of a tall building. Probably so-called because it leans against the normal superstructure. In popular parlance it has come to mean any apartment with a terrace. The movies have invested the word with a glamour which is usually reflected in the rent.—ED.

FORUM OF EVENTS

54 PRIZES—$21,000

On March 23, 1935, somewhere around 54 designers will awake collectively richer by $21,000 than they were when they went to bed the night before. They will be the prizewinners in the most important competition of its kind ever held. Sponsored by the General Electric Company and conducted by The Architectural Forum this competition should arouse the widest interest in the architectural profession.

It is for the design of houses, which best utilize all of the great technical advances of the last few years in household equipment and planning. The final winners should be designers who have thought deeply about the niceties as well as the necessities of life in the United States of Today and Tomorrow.

Said Gerard Swope, General Electric's president:

"This competition will enable the public to get a new vision of what an inexpensive home can be like in this new era of our national development. Science has made great strides in home electrification even through the Depression years.

"All the new advances in the art of living should be made available to everybody, and we are confident the architects of the country will be able to show in their designs just how this is to be done in the small homes."

To provide for the greatest possible adaptation of the designs to the realities of U. S. living the competition is divided into four classifications:

A. Small Home—Northern Climate

B. Small Home—Southern Climate

C. Medium Size Home—Northern Climate

D. Medium Size Home—Southern Climate

In each of these four classifications prizes will be awarded as follows:

1st prize $1,500
2nd prize. $1,250
3rd prize. $1,000
Honorable mentions (10) . . .$100 each

In addition to these prizes there will be a grand prize of $1,000 for the best smaller house and a similar $1,000 prize for the best larger house. Somewhere in the United States therefore there are two architects who will each receive $2,500 dollars, two who will get $1,500, two $1,250, and so on.

These fortunates may be any architect, engineer, draftsman, or designer in the United States. They may be associated in groups of two or more. They may submit as many designs as they please. Employes of either the General Electric Company or of The Architectural Forum are barred. Entry blanks have been mailed to every architect in the United States, but others may be obtained by writing promptly to the Professional Adviser, Kenneth K. Stowell, A.I.A., who may be addressed either c/o General Electric Co., 570 Lexington Avenue, New York, N. Y., or c/o The Architectural Forum, 220 East 42nd St., New York, N. Y.

The director of the competition is Mr. John F. Quinlan of the General Electric Co. of New York who so successfully directed the "Golden Jubilee of Light" a few years ago.

The Jury will consist of eleven members; seven architects representing the different sections of the United States, one expert in child training, one domestic science expert, one general contractor, and one realtor. The Professional Adviser and a competent electrical engineer will be present at the judgment in advisory capacities only.

March 12, 1935, at midnight, is the deadline. One week is allowed for the Professional Adviser to complete his labors. The Jury will function March 19, 20, 21, 22, and 23 and the awards will be announced on the 23rd. The winning designs together with the report of the Jury will be published in The Architectural Forum's May issue.

To assist the competitor the General Electric Company is compiling an information file of data which will be of invaluable assistance in the solution of these problems. This will be sent to all of those who signify their intention to compete by filling out the entry blank on page 11 of this issue. In addition there will be found (pages 12 to 17) information on the many products manufactured by General Electric Company for use in modern houses.

(*Continued on page 18*)

Acme

THE PRESIDENT'S NEW OFFICES

In the foreground: the new executive offices; in the background: the White House. When President Roosevelt left for Hawaii last July he left orders that the White House offices (built by Theodore Roosevelt) be refurbished. When he returned to Washington from Warm Springs last month his new offices, larger and lighter, were ready for him.

GENERAL ELECTRIC

HOME ELECTRIC

$21,000

IN PRIZES

The purpose of this competition is to stimulate interest in home building and to encourage better designed homes from the standpoint of health, convenience, comfort and entertainment, utilizing the latest mechanical and electrical advances.

THE General Electric Company is naturally interested in making the American home more livable, through better planning and improved design.

In offering prizes of $21,000 for more livable home designs, it is General Electric's hope to stimulate the skill and ingenuity of designers to bring about better health, increased comfort, greater convenience and improved facilities for the home entertainment of the entire family.

There have been many architectural competitions that emphasized exterior design. But so far as is known, this Competition is the first that places major emphasis on the utilization of modern interior equipment. Exterior design will of course be a factor in awarding prizes, but the judges will give greater weight to the skill and ingenuity with which the architect has provided for the maximum health, comfort, convenience and entertainment of the family for which the house is planned. This family is described in detail in the Competition program.

The G-E Architectural Competition is divided into four classifications, as follows:

Class A—*Small home—Northern climate*

Class B—*Small home—Southern climate*

Class C—*Medium Size home—Northern climate*

Class D—*Medium Size home—Southern climate*

Equal prizes are offered in each class, as noted elsewhere. Each competitor may submit as many designs as he wishes—in any or all classes; and each design is eligible for a prize. In addition to winning one or more of the $1500 prizes, a competitor may also win one or both of the two $1000 grand prizes.

Any architect, engineer, draftsman or designer, ex-

ANNOUNCES A

COMPETITION

54 PRIZES IN ALL

GRAND PRIZE for Best Small Home . . (Best Home in Classes A and B)	$2500.
GRAND PRIZE for Best Medium Size Home (Best Home in Classes C and D)	2500.
FIRST PRIZE for Best Small Home in Class not receiving Grand Prize	1500.
FIRST PRIZE for Best Medium Size Home in Class not receiving Grand Prize . .	1500.
SECOND PRIZE, in each of the four classifications . . . . $1250.	5000.
THIRD PRIZE, in each of the four classifications . . . . 1000.	4000.
HONORABLE MENTION, ten in each of the four classifications . . . . . . 100.	4000.
Total	$21,000

cept G-E employees, is eligible to compete. The Competition will begin on January 2, 1935, and close at midnight, March 12, 1935. The judging by the Jury of Award will take place on March 19, 20, 21, 22 and 23; and announcement of prize winners will be made on March 23. The Jury of Award will consist of eleven members—seven architects representing different sections of the United States, one expert in child training, one home economics expert, one general contractor and one realtor. Names of jurors will be announced on March 19, the first day of the judging.

All entries will be judged anonymously—with only a nom de plume or other identifying device appearing on the drawings.

Prize-winning designs will be published together with the report of the Jury of Award.

Competition Program and Handy G-E Reference File... Free to each Competitor

The coupon below is your entry blank. It brings you the complete Competition program and the G-E reference file. Fill it out and mail today.

For the convenience and assistance of competitors, we have prepared a handy reference file containing architectural data on all General Electric products used in home construction or equipment.

This file will be sent free to each competitor, along with complete information regarding the rules of the competition and requirements governing plans and drawings.

FREE

USE THIS ENTRY BLANK

Professional Advisor, A.F.1
G-E Architectural Competition,
General Electric Co., Room 1208
570 Lexington Ave., New York, N. Y.

GENTLEMEN: I desire to enter the G-E Architectural Competition for "Home Electric." Please send me full information and the handy G-E Reference File.

Name..
(PRINT)

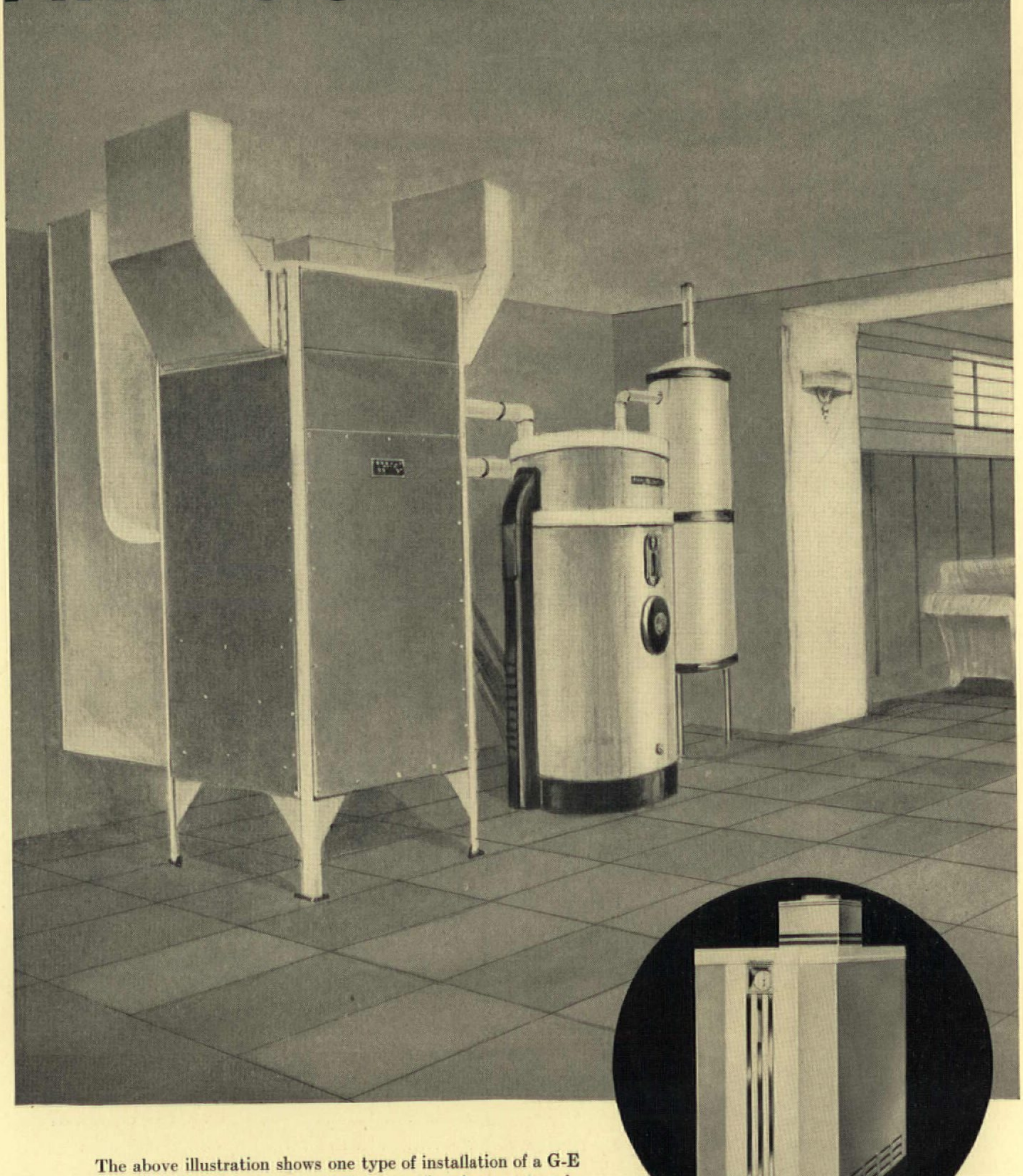
Business Connection..

....

Address..

....

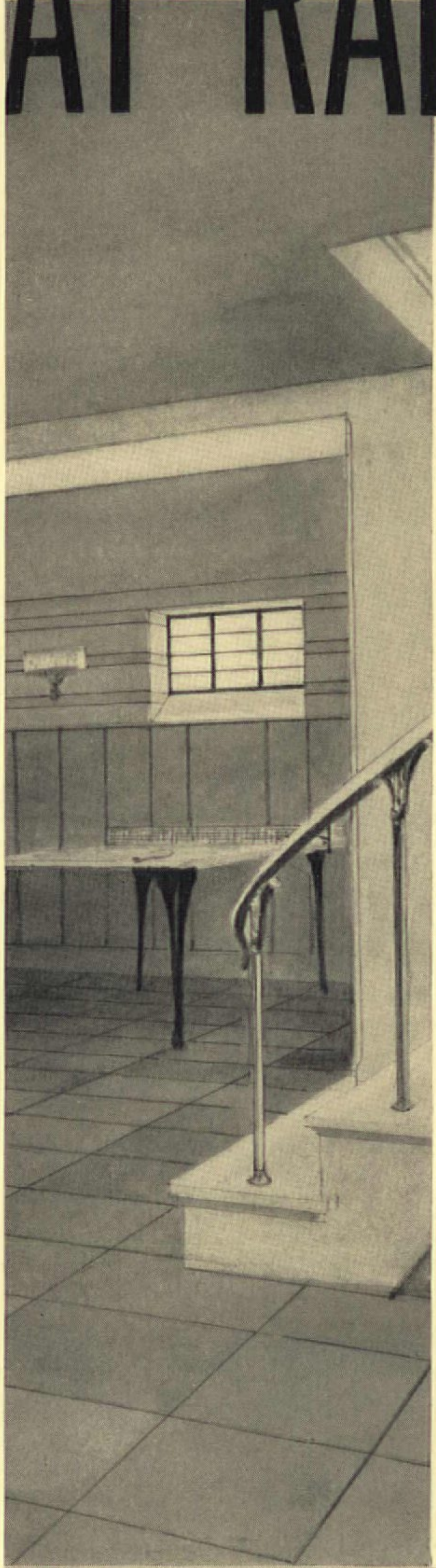
AIR CONDITIONING



The above illustration shows one type of installation of a G-E Air Conditioning System as it looks in a modern basement ready for winter service. Either the G-E Oil Furnace (as shown) or the G-E Gas Furnace (see insert) may be used to supply the heat. The Oil Furnace also supplies hot water to the storage tank.

HOME ELECTRIC COMPETITION

AT RADIATOR COST



In a new house, the G-E Air Conditioning System can be installed for about the same price as a good vapor vacuum system with concealed radiation.

THE G-E Air Conditioning System for winter service, delivering conditioned air through ducts to the various rooms, can be installed for approximately the same cost as a G-E Oil Furnace and a good vapor vacuum system with concealed radiation.

The G-E Air Conditioning System offers a number of distinct advantages, for example:—

Split System—Kitchen, bathrooms, garage—any rooms where air conditioning is not needed or not desirable may be heated by radiators in connection with the system—either steam or hot water. Also the furnace and the air conditioning unit may be placed at the most advantageous positions in the basement for connection with chimney and duct risers. They can be at opposite ends of the basement if necessary.

Uses Oil or Gas—Either the G-E Oil Furnace or the G-E Gas Furnace may be used with the system.

Cooling May be Added—The Air Conditioner is so designed that a cooling unit may be added at a later date without extensive alterations.

Tested and Proved—Before G-E Air Conditioning equipment is placed on the market, it is thoroughly tested and tried under actual living conditions in the G-E Proving Home.

Entirely designed and made by one company—G-E Air Conditioning equipment, including coordinating controls, is not "assembled." It is designed and made by General Electric under one responsibility.

Installation and service by exclusive dealers—There are G-E Air Conditioning Dealers in principal cities throughout the country. Each sells the entire G-E air conditioning line. Each has on his staff trained men who know their business, speak your language. They will work with you from the blue-print stage onward.

Architects who are entering the G-E Architectural Competition mentioned on previous pages of this magazine will receive complete descriptions of the entire G-E Air Conditioning line. Our dealer in your locality will be glad to cooperate with you on any other plans you may have on the boards. Address Air Conditioning Dept., General Electric Co., Dept. A.F.-1, 570 Lexington Ave., New York, N.Y.

GENERAL ELECTRIC
AIR CONDITIONING

HOME ELECTRIC

COMPETITION

SPECIFY G-E WIRING MATERIALS TO ASSURE FHA ACCEPTANCE

Neither in its program for new building nor its modernization operation will FHA tolerate poor-quality materials. The *wiring system* is one of the first items that local FHA offices sharply scrutinize. Play safe—specify G-E Wiring Materials and *know* that they will be approved.

G-E White Explosion-proof Conduit, galvanized under the "Hot-dipped" process and then Glyptal-coated, resists corrosion, and is economical to install because it bends, cuts and threads easily. G-E Tumbler Switches, Convenience Outlets and Plates are durable and easy to install. Textolite used in the Outlets and for the Plates and Switch handles, assures durability and provides neat, lustrous appearance. G-E Safecote Building Wire is available in three easily identified grades which satisfy varying building requirements. Assures safe, economical, lasting service.

General Electric has prepared special literature to aid architects in selecting the right wiring systems and materials. Write immediately to Section CDW-221, Merchandise Dept., General Electric Company, Bridgeport, Conn.

BETTER HOUSING PROGRAM
FEDERAL HOUSING ADMINISTRATION

Enter the General Electric Competition for design of the G-E Home Electric. See announcement, on pages 9, 10 and 11.

GENERAL ELECTRIC

WIRING MATERIALS

MERCHANDISE DEPARTMENT, GENERAL ELECTRIC COMPANY, BRIDGEPORT, CONNECTICUT

HOME ELECTRIC COMPETITION

Make Lighting a Prime Consideration

Plan light for easy seeing

NEVER before has there been such widespread interest in home lighting. This is largely the result of the startling facts disclosed by the Science of Seeing, and the subsequent Better Light-Better Sight movement sponsored by three great industries—Electrical, Optical, and Paint. The public has been given an entirely new conception of light and vision. Sight Saving Councils and Better Light-Better Sight bureaus have been organized in local communities throughout the country. Parents are learning of the vital importance of protecting their children's eyes—and their own. Sales of the I.E.S. Better Sight lamps designed by the Illuminating Engineering Society to give adequate light for reading and other visual tasks have reached an estimated total of 300,000 in the last few months alone. Thousands of lighting advisors are making home calls telling the story of better light in the most compelling way. The new Science of Seeing has revealed some startling facts. For example, it reveals:

That one-fourth of our young people, three-fourths of all people over fifty, and 95% of all people over 60 have defective vision. Inadequate light is a prominent cause.

That light acts as a magnifier of small details. An object must be about twice as large to be visible under 1 footcandle of light as it would have to be under 100 footcandles. One hundred footcandles is approximately 1 per cent of maximum daylight.

That good lighting generally aids defective eyes even more than it helps normal eyes.

That reading when the page is brightly illuminated and the rest of the room is comparatively dark often causes unnecessary eyestrain and fatigue. Some of the light should go to the ceiling.

That levels of illumination far less than 10 footcandles (the minimum required for reading) are common in homes and offices. For comparison: the very comfortable level of illumination under the shade of a tree on a summer day is about 1000 footcandles.

A prime consideration in the General Electric competition should be given especially to lighting in those rooms of the home where accuracy of seeing is important . . . particularly the living room, the study, the kitchen, the bathroom, and the workshop. In short, lighting should be planned to meet seeing needs.

Send for a copy of "The New Story of Seeing"—an interesting, helpful booklet which is free. It tells you how light can be measured . . . how much light is needed for various visual tasks . . . and how to get it. For this and other information helpful in specifying correct lighting, write to General Electric Company. Dept. 166, Nela Park, Cleveland, O.

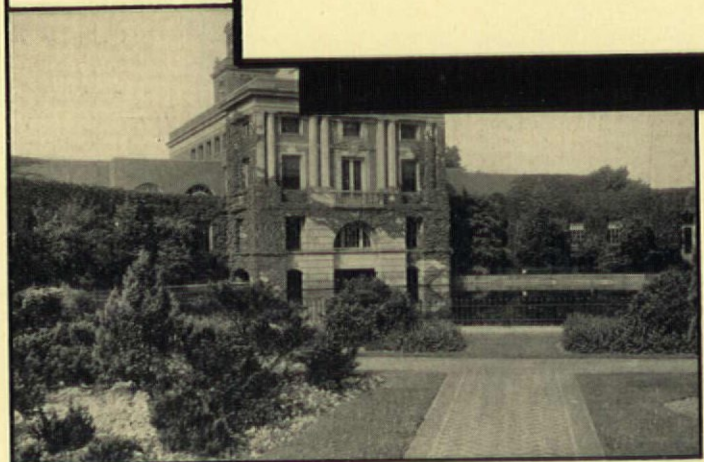
GENERAL ELECTRIC
MAZDA LAMPS

HOME ELECTRIC

COMPETITION

THE GENERAL

wins top honors in



The General Electric Kitchen Institute offers full cooperation to architects on
MODERN KITCHEN PLANNING

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The perfected General Electric Dishwasher washes all the dishes hygienically clean in 5 minutes for 1c a day. Hands never touch water, and there is no breakage or chipping of even the daintiest china.

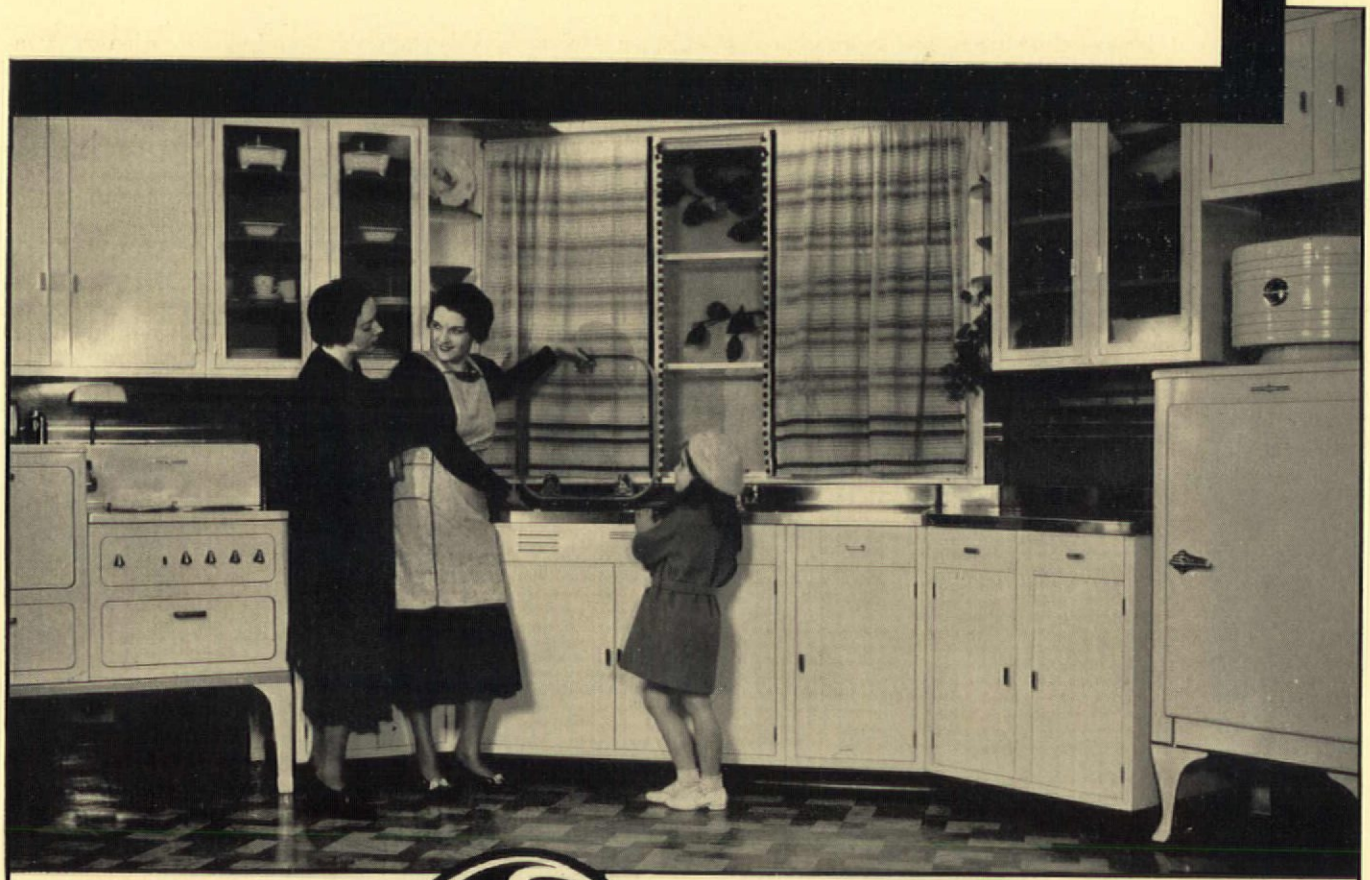
Your nearest G-E distributor will be glad to furnish, through the Institute, complete details on any General Electric Kitchen appliances that fit into your plans, for modernization of new construction of either single or multiple residential dwellings. General Electric Co., Specialty Appliance Sales Department, Section CG1, Nela Park, Cleveland, Ohio.

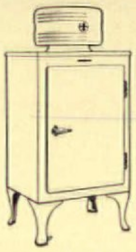
GENERAL ELECTRIC

HOME ELECTRIC COMPETITION

ELECTRIC KITCHEN

any competition !!!





(Left) World's finest electric range — the G-E Imperial. (Right) G-E Companion—$72 (plus freight). Many other models.

General Electric refrigerators are first in dependable performance, first in modern styling, and lowest in operating cost. Universally recognized as the standard of refrigeration excellence. Models and sizes for every requirement...including Monitor Top, Flat-top and Liftop types.

G-E Electric Dishwasher washes all the dishes in 5 minutes. Costs less than 1c a day to operate. Models for every kitchen.

THE
FORUM OF EVENTS

(*Continued from page 8*)

As noted above the program will be sent only to those who have returned entry blanks to the Professional Adviser. It may not be amiss, however, to quote from Mr. Stowell's foreword.

"The present approach to the designing of homes should not be merely on the basis of precedent in plan and design. It implies rather a technique of careful analysis embracing all the activities of each member of the household in order to provide facilities and environment best suited to these activities. The technique involves a studied balance and adjustment of the facilities provided in order to prevent one from interfering with another. It requires planning for the multi-use of space as well as specific spaces for each activity with its necessary furniture or equipment.

"The designer's problem is that of developing the utmost efficiency in space utilization, in arrangement, in furniture, in equipment, and in mechanical and electrical plant, within the size limitations necessarily imposed by economy. The provisions for health, comfort and convenience will include the latest developments in step-saving, labor-saving and time-saving equipment. The properly planned and equipped home, utilizing to the fullest the contributions of the 'power age' will allow a far greater amount of time and energy to be devoted to recreation, entertainment and development; in short, for the growth of home life."

ACADEMY IN ROME

The American Academy in Rome is announcing its annual competitions. The terms have a familiar ring to those who have watched the competitions throughout the years. For those who have not we offer their gist:

"In architecture the William Rutherford Mead fellowship is to be awarded, in landscape architecture the Kate Lancaster Brewster fellowship, in sculpture the Rinehart fellowship and in musical composition the Walter Damrosch fellowship.

"The competitions are open to unmarried men not over 30 years of age who are citizens of the United States. The stipend of each fellowship is $1,250 a year with an allowance of $300 for transportation to and from Rome. Residence and studio are provided without charge at the Academy, and the total estimated value of each fellowship is about $2,000 a year.

"The term of the fellowship in each subject is two years. Fellows have opportunity for extensive travel and for making contacts with leading European artists and scholars.

"Entries for competitions will be received until *February 1*. Circulars of information and application blanks may be obtained by addressing Roscoe Guernsey, Executive Secretary, American Academy in Rome, 101 Park Avenue, New York."

LITTLE TIN SCHOOL HOUSE

For a dozen years, Philadelphia's Board of Education has owned a dozen galvanized iron shacks, unprepossessing at best, but with fairly adequate window space on two sides and the old-fashioned stove pipes sticking out at the ends and up in the air, dismal, antiquated and impermanent. These were "portable" schools and the Board shifted them as population shifted. They were a sort of shame-faced stepsister of the larger and "importable" schools, and they simply served to catch the overflow when population became too dense and the Board did not feel it should spend the money to enlarge the existing schools or build new ones; or did not have the money to build anything in the first place.

For a dozen years Philadelphia had them, spotted on the fringes of Hamilton School or Morton School or McDaniel School, and then last month the trouble cracked out and nothing would stop it. The cold was coming out of the West and one mother of a "tin school" child at Hamilton School complained that the galvanized iron structure was insufficiently heated. Why, she asked in her impregnable position as taxpayer, should not her child's schoolhouse have steam heat like other schoolhouses? The Board of Education knew it was in for it; the newspaper headlines began stretching over all eight columns. Mrs. Beatrice Schwager, 5828 Addison Street, became chairman of a committee of mothers. The Board of Education began figuring costs. Nine of the schools could be heated at a total cost of $2,900. Steam pipes could be run into the shacks from the main buildings. But two schools needed steam heating equipment of their own. The cost here would total $5,800 — more than the total costs of the schoolbuildings.

While the Board of Education was contemplating these dismaying facts, Mrs. Schwager issued an ultimatum.

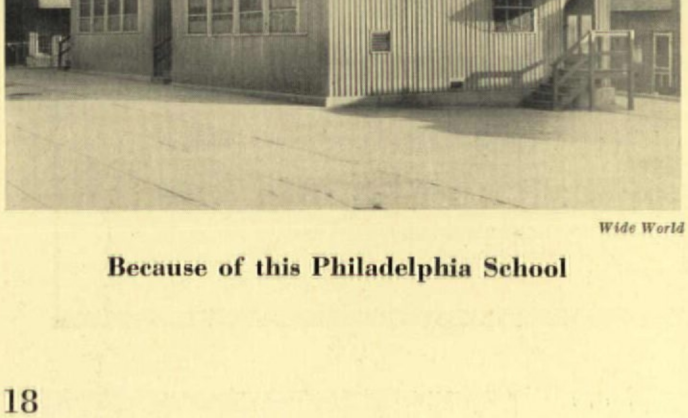
"Even if they put ultra-violet rays in the shacks," she said, "we still wouldn't send our children to them."

The Philadelphia *Record* published pictures of "tin school" students. The mother of Herbert Toll, 10, said he had had a series of colds. The mother of Harry Glick, 10, said the school's lighting was so bad her son had temporarily lost his eyesight, was now wearing eyeglasses. David Feldman, 10, missed 34 days of his last term because of illness.

The mothers organized a strike and gave their youngsters placards reading DOWN WITH THE SHACKS, TIN HOUSE STRIKE. The youngsters posed for newsphotographers and tried hard to look serious but it was great fun.

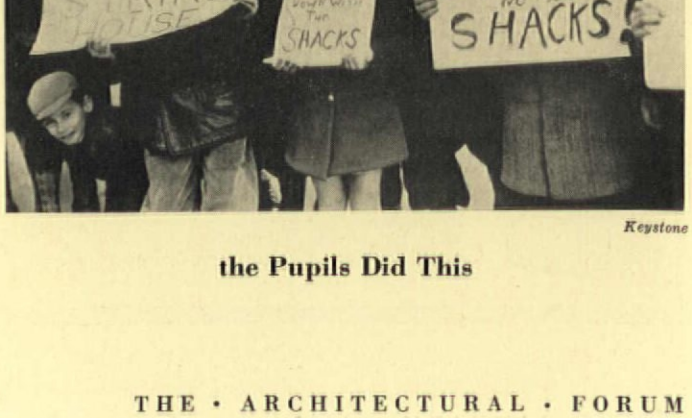
The School Board of Education promised heat, promised light and began moving the students into more solid schools. The strike

(*Continued on page 46*)



Wide World

Because of this Philadelphia School



Keystone

the Pupils Did This


It is not a matter to be taken lightly, the confining of children under artificial surroundings during the most active time of their lives.
THE HERMAN NELSON
SYSTEM OF AIR CONDITIONING FOR SCHOOLS

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THE
ARCHITECTURAL
F O R U M

CONTENTS FOR JANUARY 1935

BUILDING MONEY

Detailed Contents on Page 97

VOLUME LXII NUMBER ONE

THE ARCHITECTURAL FORUM is published monthly by Rogers and Manson Corporation, Howard Myers, President: Publication office, 160 Maple Street, Jersey City, N. J. Executive, Editorial and Advertising Offices, 220 East 42nd Street, New York. Advertising Manager, George P. Shutt, Business Manager, W. W. Commons, Subscription office, 350 East 22nd Street, Chicago, Illinois. Address all editorial correspondence to 220 East 42nd Street, New York. Yearly Subscription, Payable in Advance, U. S. and Possessions, Cuba, Mexico, South America, $7.00. Canada, $8.00, Canadian duty 60c. Elsewhere, $9.00. Single issues, including Reference Numbers, $1.00. All copies Mailed Flat. Trade Supplied by American News Company and its Branches.

PROPOSITION

Three hundred years ago, in Boston, the first public school in America was established. The rents of Deer, Long and Spectacle Islands were voted to support it. Shakespeare was less than twenty years in his grave and John Cotton saw to it that the half dozen pupils were well instructed in religion.

In 1934, the United States spent $1,753,300,000 on public elementary and high school education. There were twenty-six million students, black, white, short, tall, shy, bold, bright, stupid, male, female, and the irrespective cost per pupil was $66.33. And everyone of these sixty-six dollar pupils went to a schoolhouse that might be a tent, a frame building in Mississippi, a million and something dollar Junior High School in Mamaroneck, N. Y., or the one in Philadelphia that is built of galvanized iron.

The school architect was fairly busy in 1934. The United States spent $97,000,000 on school buildings, sites and equipment. It was nothing compared with the peak year 1926 when capital outlay was $411,000,000, but it was something.

Education is big business. It pays teachers, school superintendents, janitors and athletic supervisors. And architects, construction engineers, plumbers, the makers of brick and the quarriers of Indiana limestone. And sometimes politicians and the canny owners of real estate.

Education is also socially significant. In most States it is second to relief on the allotment rolls. It is the intimate and daily concern of at least one out of every five persons in the U. S.

The year 1934 saw a $125,000,000 PWA allotment for school buildings. The school building figure for 1935 will many times surpass that amount.

What are the school buildings that U. S. architects will erect? And what should they be? And where should the architects look for guidance?

With this issue THE ARCHITECTURAL FORUM indicates some answers to these questions.

The school architect is interested in building schoolhouses. But in order to build the best schoolhouse he can, he should know what is happening to education. If he finds out that throughout the United States enrollments are up and expenditures down, he has a valuable tip on how to fashion his house. A conversation with a school superintendent or "four friends on the Board of Education" should not be enough. The following pages contain a series of charts which show the present state and trends of education—its enrollments, past and present, its expenditures, cost per pupil, capital outlay, the distribution of Federal education dollars, the redistribution of education dollars possible under State control. No school architect, no educator or teacher should tackle his job without an awareness of these facts. No parent should be ignorant of them.

Who are education's experts? The teachers, the superintendents, the educators, the architects who build the schoolhouses. To these THE ARCHITECTURAL FORUM sent questionnaires. The result is a symposium of education fact and opinion in which the teacher is permitted to complain about narrow and dark corridors, the architect calls for larger budgets, the superintendent accuses the architect of not grasping the presented problem and the educator outlines his belief in, his hopes for the education of the future. The difference between that education and the education of today is also the difference between tomorrow's schoolhouse and today's.

But what is the schoolhouse of today? In France and Italy, at its best, it is glass-walled classrooms, simple and efficient. In the U. S. it is familiar in a thousand towns in brick and white Colonial facade topped by the ornamental cupola where no bell rings. It is not altogether bad but it could be vastly better, and that betterment entails no budget inflation. To prove the point THE FORUM asked four famed architects—NEUTRA, LESCAZE, HARRISON, BARNEY—to submit plans and drawings of solutions for a possible or actual site. These plans appear herein. No such schools exist in the U. S. today but there is no reason why they should not. Schools which break as completely with tradition have been built and are being built today in Holland and Austria, in Mexico and Italy. THE ARCHITECTURAL FORUM presents a portfolio of such European schools to show how Europe today is answering the problem of sheltering education.

This issue of THE ARCHITECTURAL FORUM is a School Reference Number. In it the reader will find a bibliography and pertinent articles on such subjects as air conditioning, auditoriums, gymnasiums, classroom equipment. He may read about lighting, discover that in 185 out of 232 surveyed schools the lighting was below a minimum standard which was itself too low. He will find listed the latest equipment, trivial and important, the mass of gadgetry which has been developed for education in the past few years.

But THE FORUM was not satisfied with such a routine listing. Implied in every good schoolhouse plan is the entire theory of education and its predictable trends. What these trends have been and what they will be THE ARCHITECTURAL FORUM has attempted to portray.

Adequately to house the education of the future requires revision of antiquated school building codes. It is sure to demand a more realistic use of the school building dollar. But primarily it demands sound, brilliant thinking. That which follows is planned to provoke such thinking.

CHARTING U. S. EDUCATION

Dr. Paul R. Mort, Director of the School of Education in Columbia University's Teachers College, has recently said, "there is no escaping the conclusion that defects in the school finance structure are denying decent and proper educational advantages to at least 10,000,000 United States boys and girls. Teachers cannot help it; nor can school boards. The problem demands legislative action and legislative action follows popular demand. It is up to the people of the United States to see to it that their country's educational maladjustments be put right."

With this statement in mind THE ARCHITECTURAL FORUM has prepared the following charts showing the condition, past and present, of education in the United States.

Herewith, in a form simply and quickly understandable, is portrayed the answer to one of the most important questions in the United States: What has Depression done to education?

The reader can not only see how much expenditures for education have dropped in recent years but can form some idea as to how much they should be increased in the future.

He can trace the increase, present and future, in the demand for new educational facilities caused by the present adult unemployment and the present Administration's passage of child labor laws.

He can see what percentage of total educational budgets is normally spent for buildings and gain a picture of the number of new buildings that must be built in the next few years in order to catch up with increased demand and replace obsolete structures.

He can see the amount of money that has been allotted to education by Federal agencies and estimate whether that Federal aid is or is not sufficient. He can see the relation between local taxes and educational budgets and draw his own conclusions.

A few things unfortunately cannot be reduced to chart form, such as the diminishing attention paid to the individual pupil as a result of increased class sizes, the forced elimination of special services, and the reduction in the supply of such things as text books, library books, and instructional material of various sorts.

These charts show the past and present. THE ARCHITECTURAL FORUM believes they also indicate the future.

RESEARCH AND CHARTS PREPARED BY PAUL GROTZ

ENROLLMENT UP

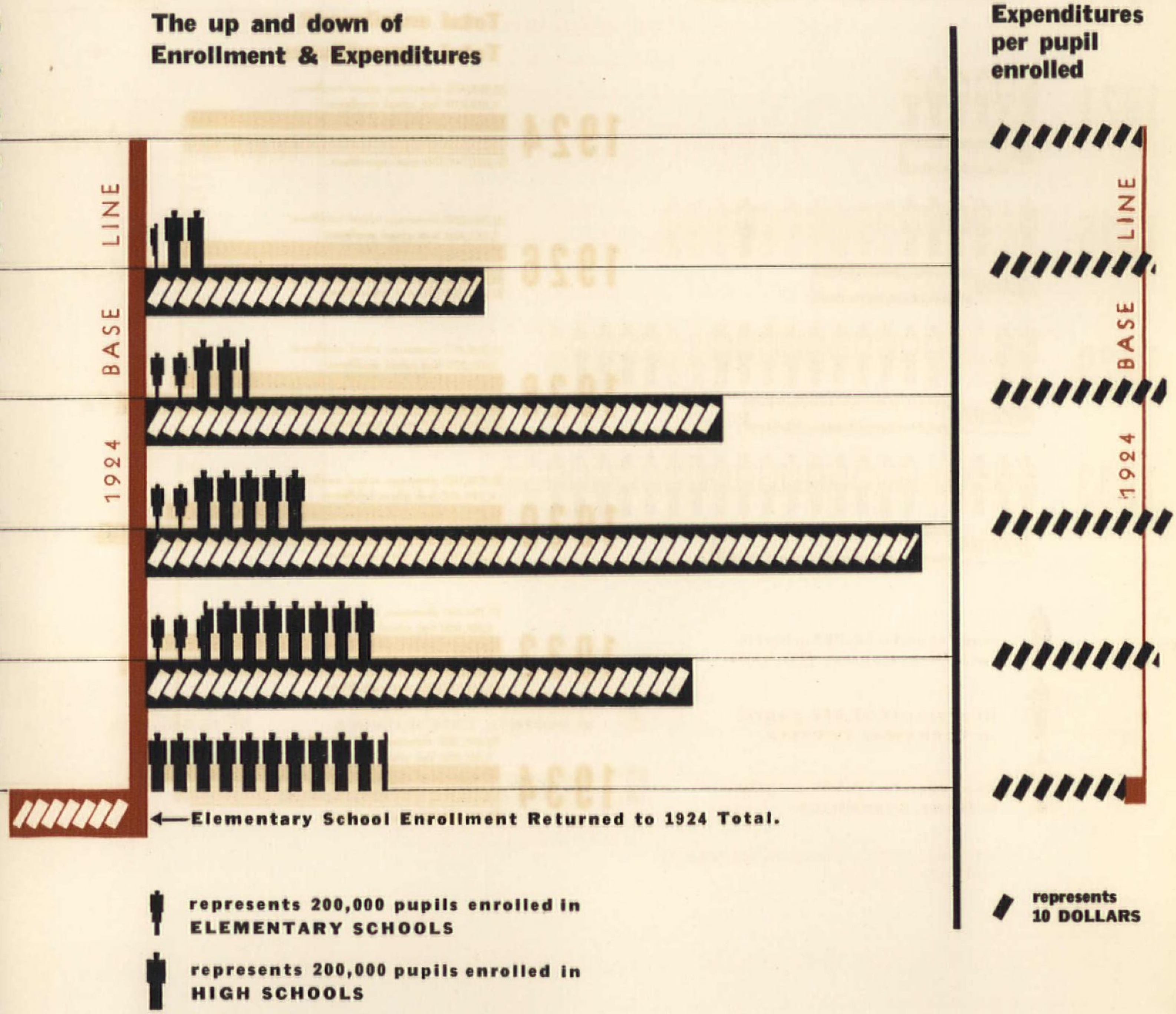
IN PUBLIC ELEMENTARY AND HIGH

WITH school enrollment up 2,071,000 for 1934, total school expenditure was $68,000,000, less than in 1924. The result: An army of school children without seats, books, sufficient teachers, adequate schoolhouses. Child labor has been abolished but child education is not being substituted.

That part of the chart on the right hand page shows a large scale detail of conditions. Since high school facilities cost more, as a rule, than do elementary, the increase in high school enrollment and the decrease in total expenditures have created a worse condition than is apparent at first sight.

EXPENDITURES* DOWN

SCHOOLS OF CONTINENTAL U.S.A. 1924–1934



* Includes current expenses, capital outlays and interest.

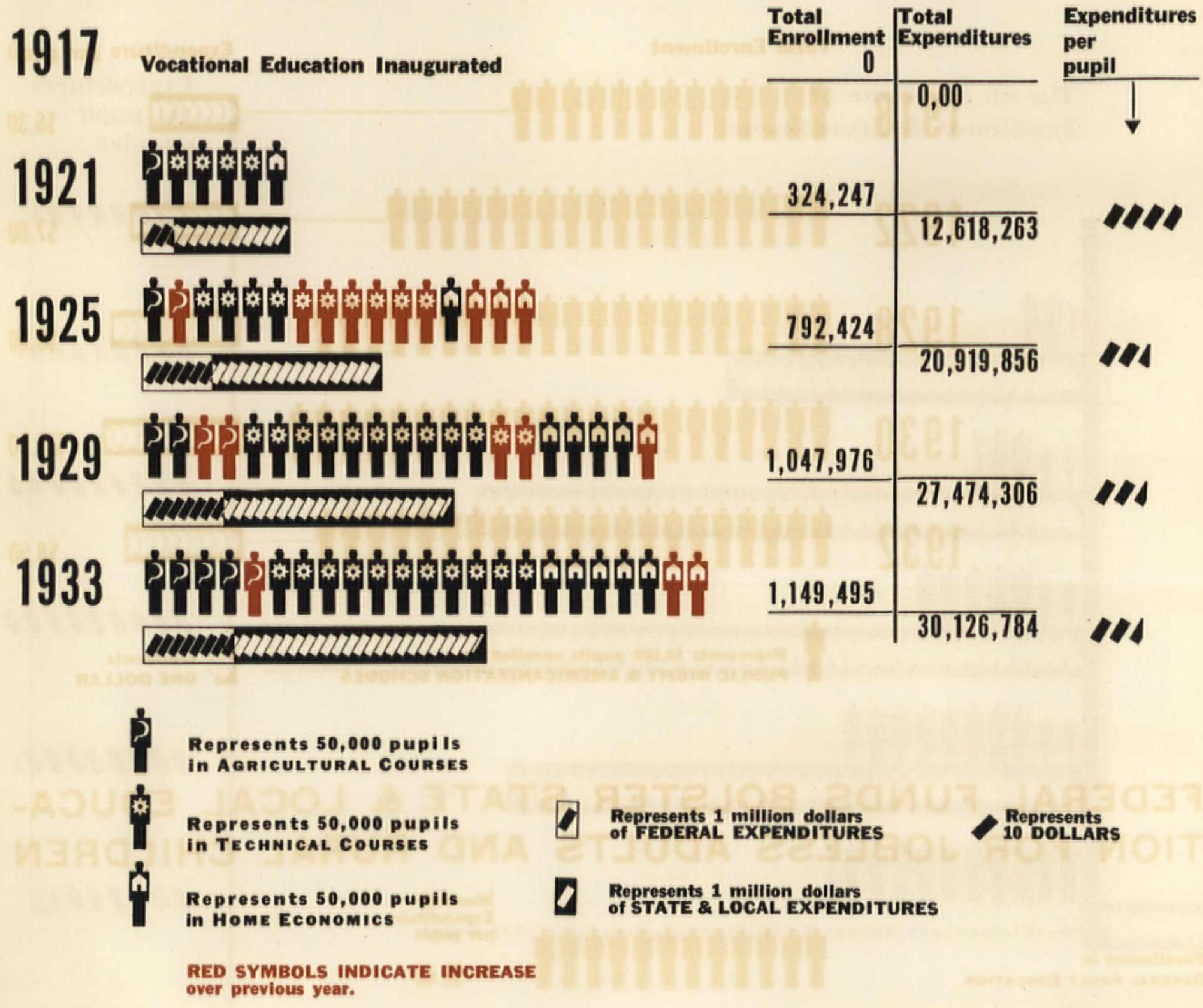
Figures up to 1932 were taken from statistics published by the United States Department of the Interior, Office of Education.

Figures for 1934 were taken from estimates by the National Education Association.

CHART 1

VOCATIONAL EDUCATION

EXPENDITURES LAG BEHIND ENROLLMENT



IN 1917 Congress made vocational education mandatory in all States. The immediate result was the education of 321,247 persons in agriculture, trade and home economic vocations at a \$39.28 per pupil expenditure.

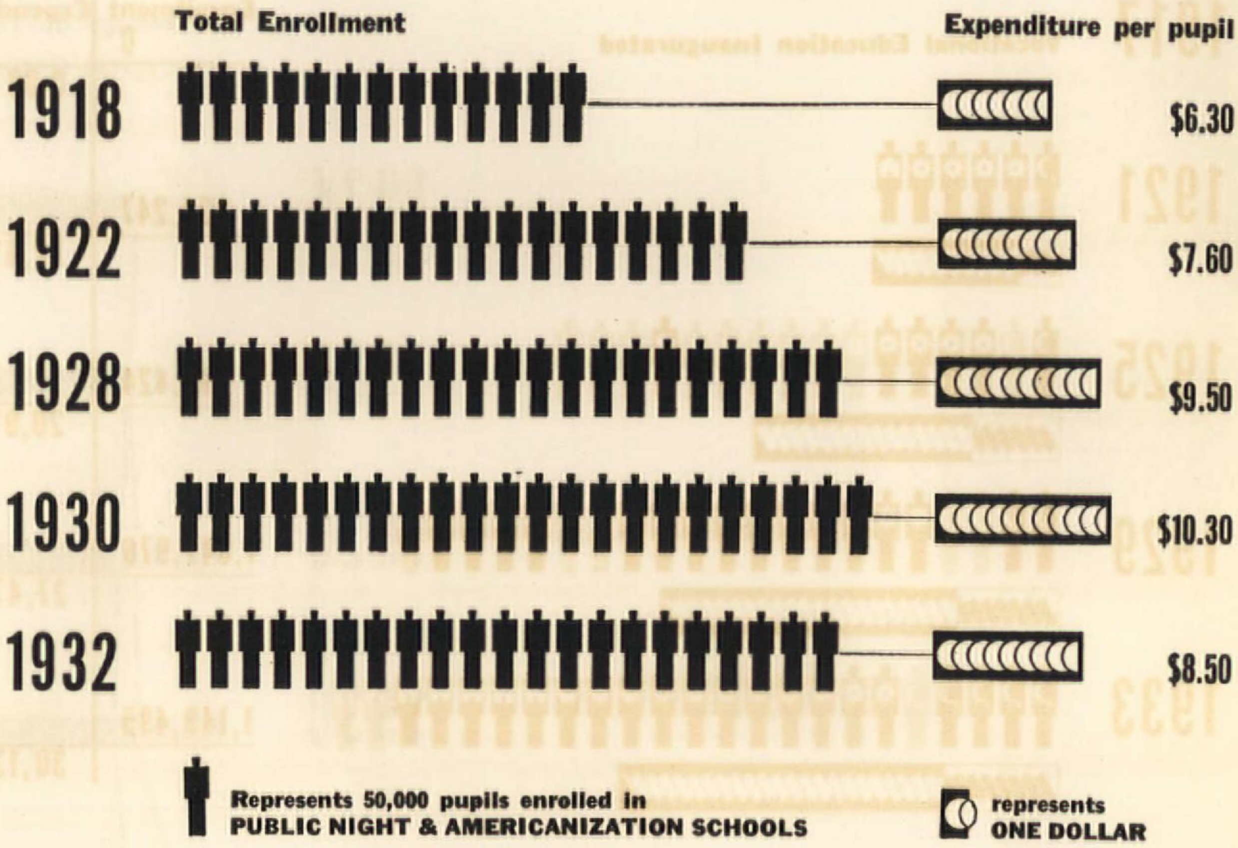
Today with immigration at a standstill, skilled tradesmen and artisans must be educated, not imported. Yet, in 1933, the United States spent only \$26.20 on each of 1,149,495 persons seeking vocational education.

The Depression problem of social unrest has created fresh need for adult education. The Federal Emergency Relief Administration has been forced to assume part of the burden which city and local governments could not carry.

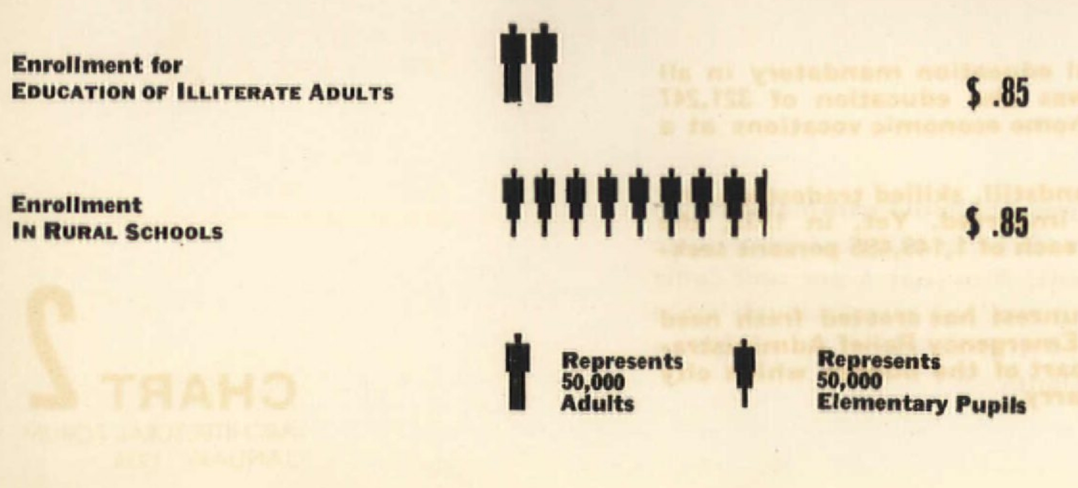
CHART 2

ADULT EDUCATION

SLOWED UP BY LACK OF STATE AND LOCAL FUNDS

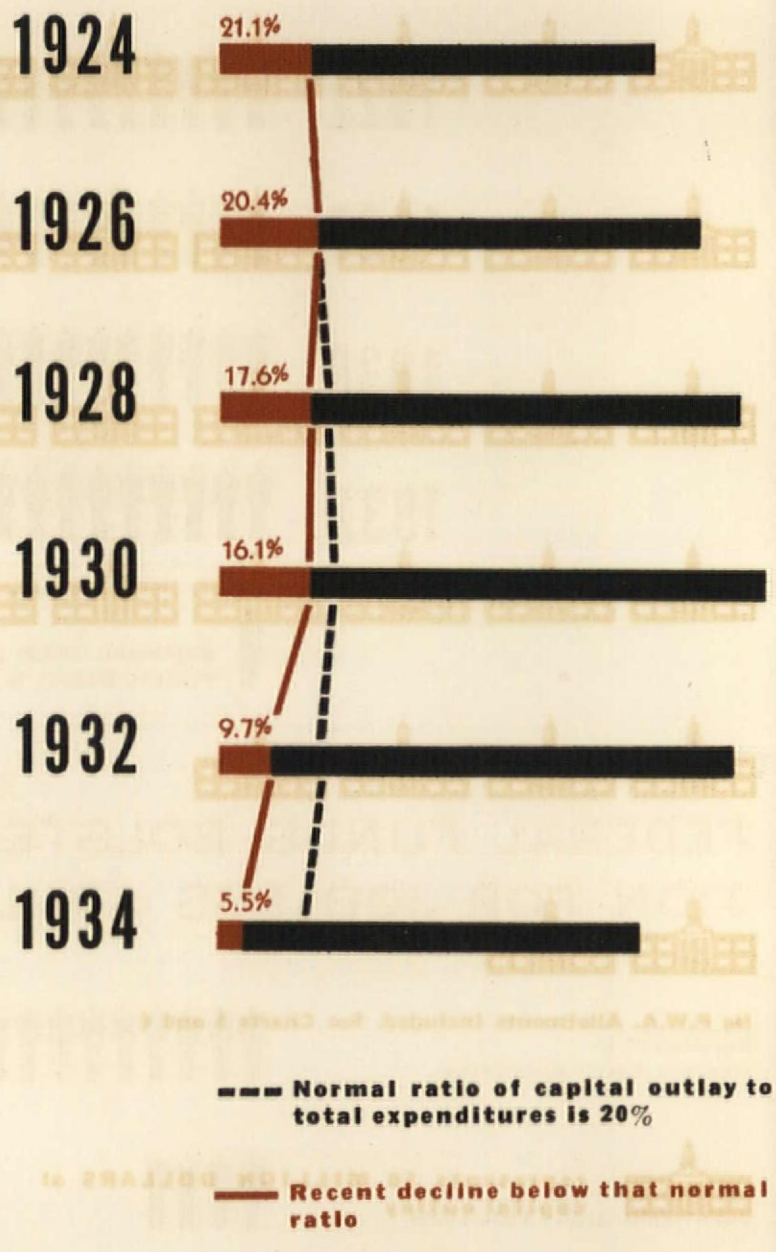


FEDERAL FUNDS BOLSTER STATE & LOCAL EDUCATION FOR JOBLESS ADULTS AND RURAL CHILDREN



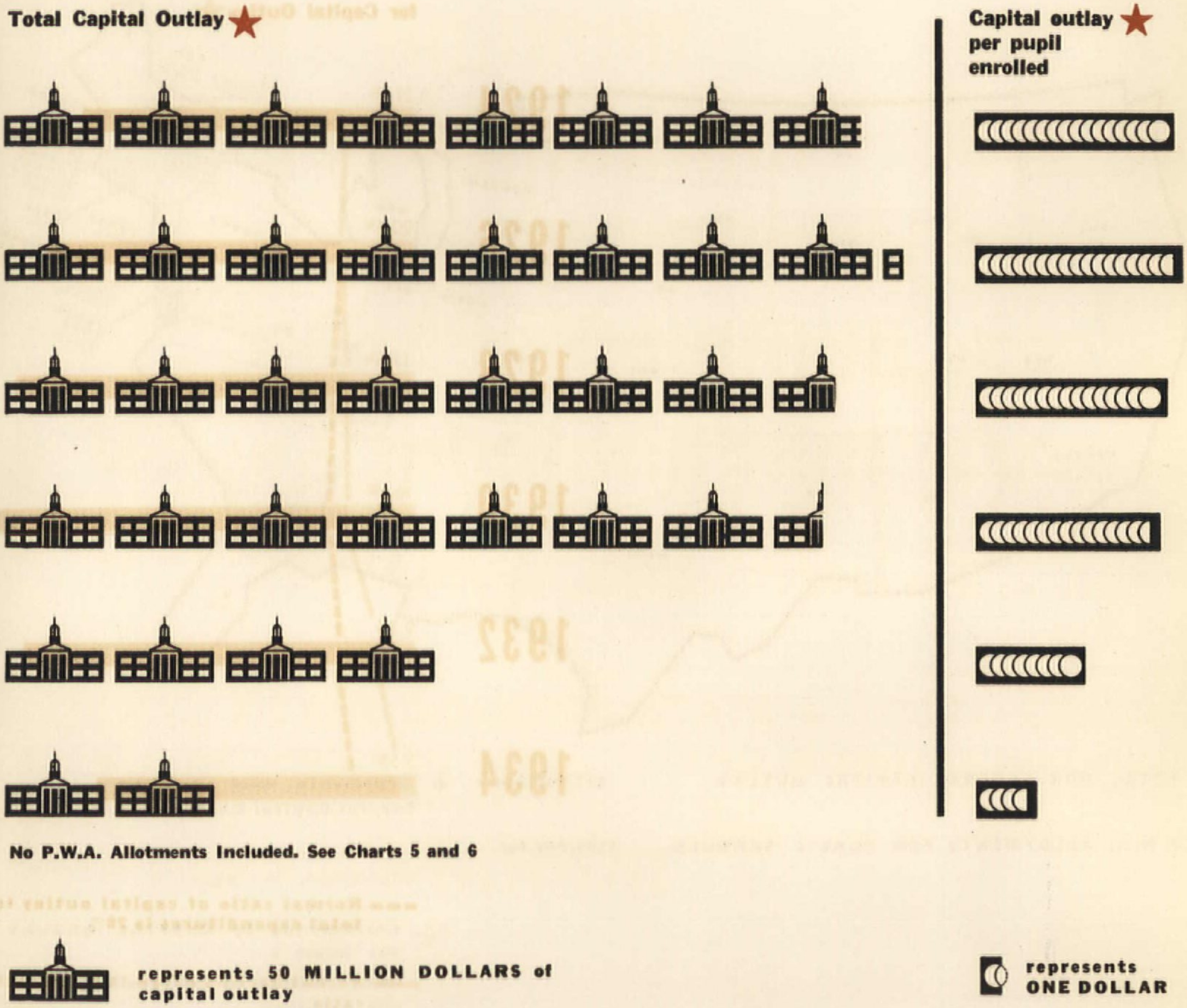
SCHOOL BUILDINGS, SITES AND

Percentage of Total Expenditures spent for Capital Outlay★



School buildings, sites and equipment should command 20 per cent of educational allotments. In 1934 this accepted percentage had dwindled to less than 6 per cent. And that 6 per cent came from a total expenditure which had declined tremendously since its 1930 peak. The result is reflected in the lamentable condition of the majority of today's school plants.

EQUIPMENT SHARE LESS AND LESS IN THE EDUCATIONAL DOLLAR



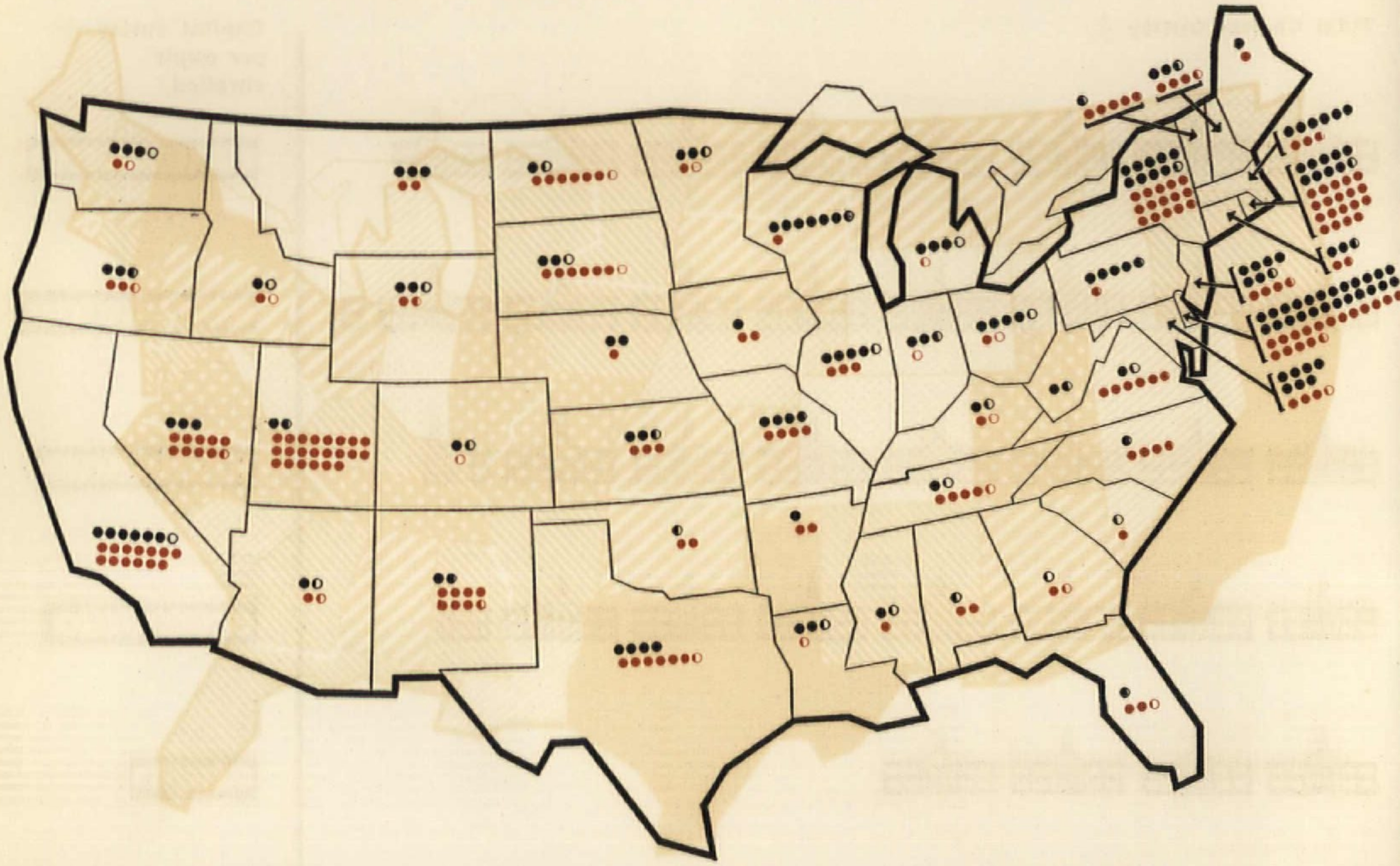
Figures up to 1932 taken from statistics published by the United States Department of the Interior, Office of Education. Figures for 1934 estimated by the National Education Association, Washington, D. C.

★ CAPITAL OUTLAY means Expenditures for new Buildings, Sites and new Equipment ONLY.

CHART 4

P. W. A. SCHOOL ALLOTMENTS★

EXCEED NON-FEDERAL CAPITAL OUTLAY IN 1934



TOTAL NON-FEDERAL CAPITAL OUTLAY: $97,600,000

P.W.A. ALLOTMENTS FOR PUBLIC SCHOOLS: $108,000,000

● **Represents ONE DOLLAR of non-Federal Capital Outlay spent per Pupil**

● **Represents ONE DOLLAR of P. W. A. Allotments Per Pupil**

★ **Corresponds to CAPITAL OUTLAY See Chart 4.**

ALLOTMENTS to colleges and libraries excluded

Unable to build schools because they could not sell their bonds, unable to sell their bonds because they were already debt-laden, cities and municipalities turned to the Public Works Administration for money. Thus, last year, for every $4 of capital outlay made by States and municipalities, almost $5 was contributed in the form of PWA loans and grants. So, for the first time the Federal Government recognized its responsibility in maintaining educational standards.

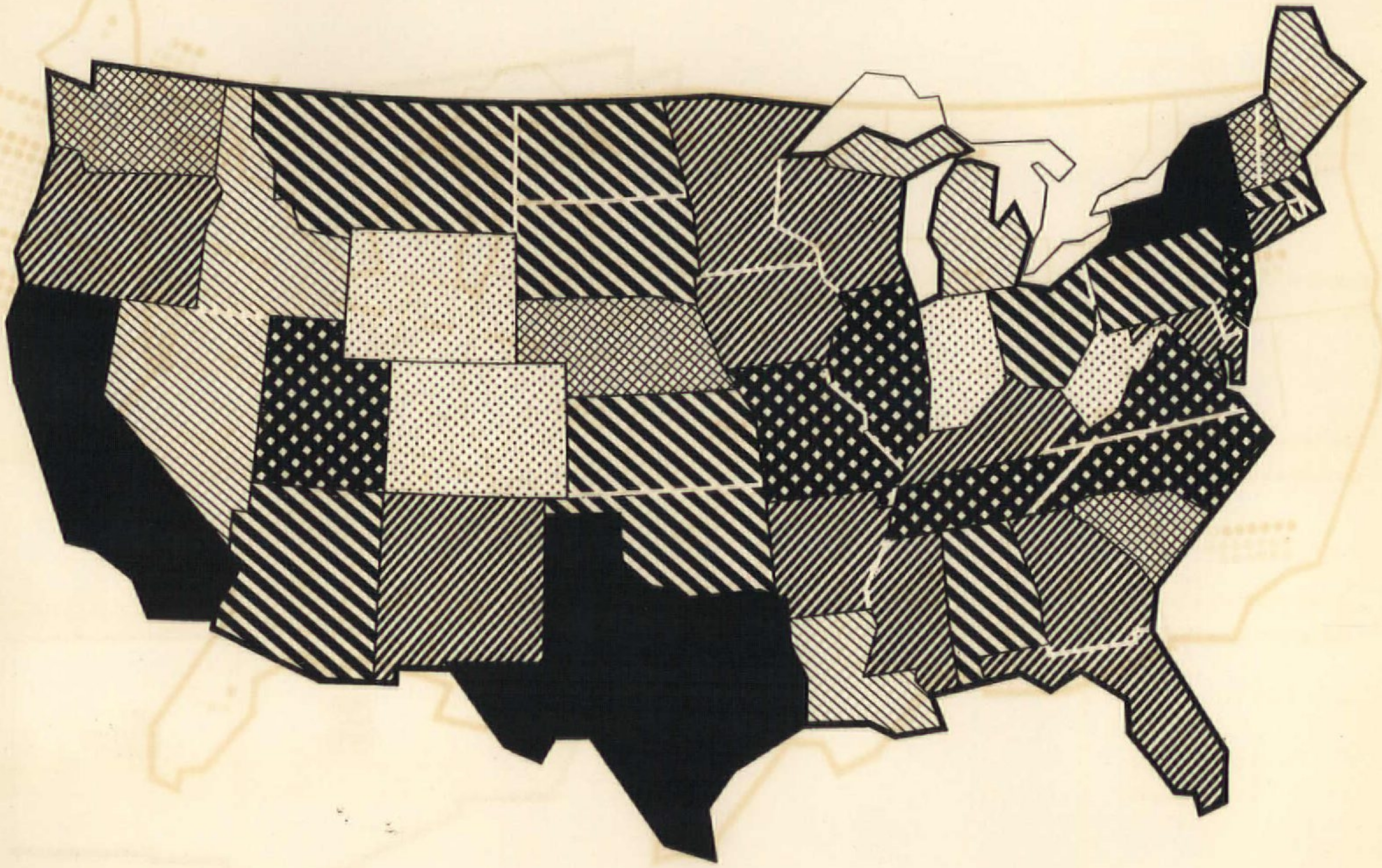
Public Works Administration allotments were no cure-all for education's needs. No State received all that it required. For most States their share was merely so many drops in an almost empty bucket.

CHART 5

P. W. A. SCHOOL ALLOTMENTS

RANGE FROM NEW YORK's $ 33,272,000

TO WEST VIRGINIA's $ 0



DOLLARS

- 5,000,000 and over
- 2,500,000-5,000,000
- 1,000,000-2,500,000
- 500,000-1,000,000
- 250,000- 500,000
- 100,000- 250,000
- 0- 100,000

	DOLLARS		DOLLARS		DOLLARS		DOLLARS
Alabama	1,282,500	Maine	136,400	Ohio	1,374,005		
Arizona	1,389,100	Maryland	945,000	Oklahoma	1,347,898		
Arkansas	907,308	Massachusetts	2,126,600	Oregon	693,950		
California	14,397,870	Michigan	241,300	Pennsylvania	1,503,370		
Colorado	51,000	Minnesota	626,800	Rhode Island	2,301,228		
Connecticut	568,600	Mississippi	511,116	South Carolina	460,200		
Delaware	733,600	Missouri	2,775,402	South Dakota	1,019,300		
Florida	830,000	Montana	2,409,800	Tennessee	2,786,500		
Georgia	951,685	Nebraska	324,100	Texas	8,242,200		
Idaho	125,900	Nevada	190,500	Utah	3,124,900		
Illinois	4,188,761	New Hampshire	267,500	Vermont	320,400		
Indiana	59,600	New Jersey	2,981,800	Virginia	3,389,320		
Iowa	998,100	New Mexico	820,400	Washington	419,000		
Kansas	1,167,300	New York	33,271,938	West Virginia	 0		
Kentucky	656,400	North Carolina	3,290,200	Wisconsin	594,500		
Louisiana	142,900	North Dakota	1,027,750	Wyoming	90,000		

CHART 6

STATE INCONSISTENCIES TO URBAN AND RURAL SCHOOL

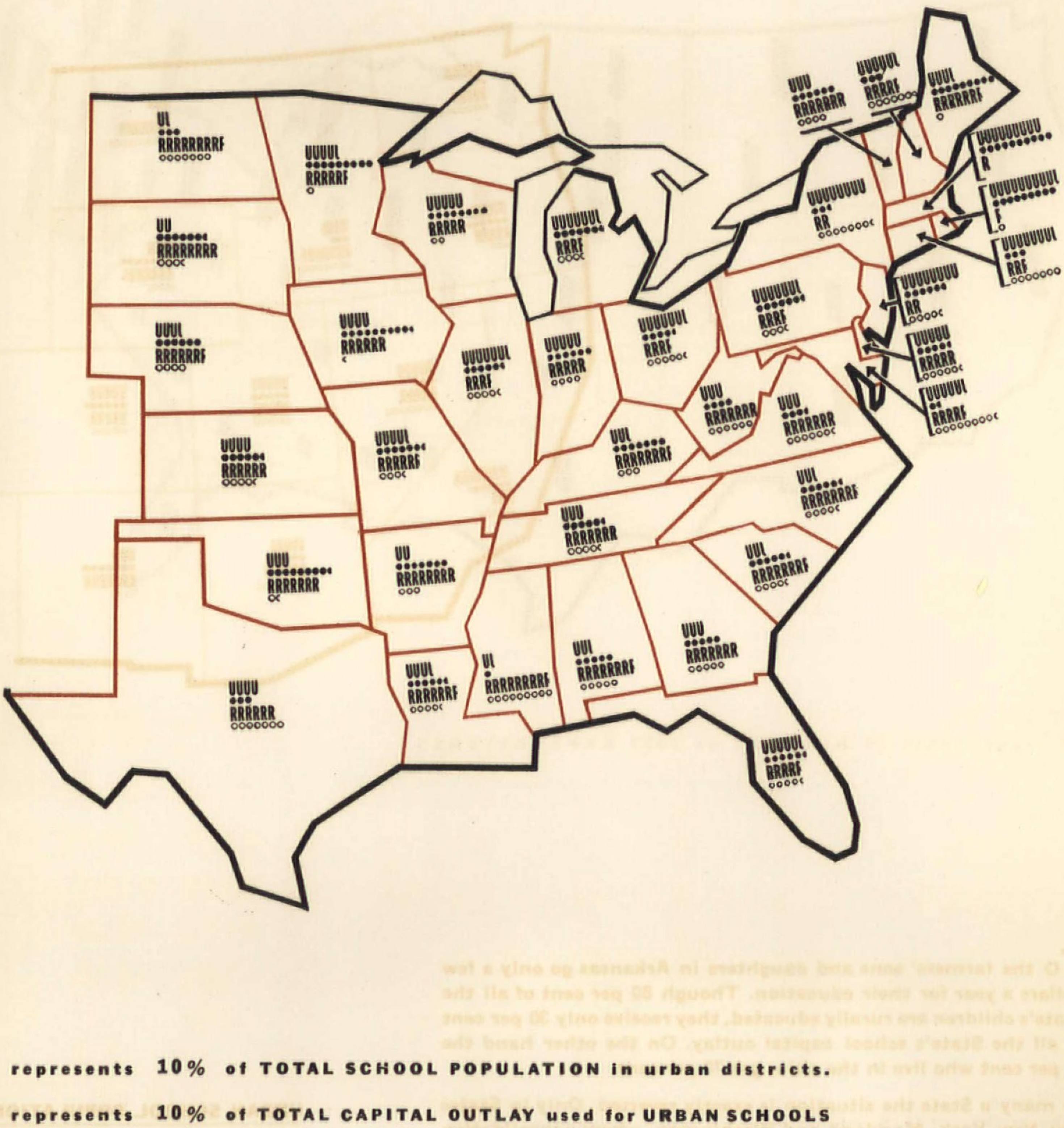
To the farmers' sons and daughters in Arkansas go only a few dollars a year for their education. Though 80 per cent of all the State's children are rurally educated, they receive only 30 per cent of all the State's school capital outlay. On the other hand the 20 per cent who live in the cities get 70 per cent.

In many a State the situation is exactly reversed. Only in States like New York, Maryland and Washington, where consolidation programs are in operation, is educational money distributed proportionately to urban and rural pupils. In almost all States, the amount of money to be expended is left to the ability of local citizens to provide the necessary funds through taxation.

URBAN SCHOOL POPULATION:

RURAL SCHOOL POPULATION:

IN RATIO OF CAPITAL OUTLAY POPULATION IN 1932



U represents **10%** of **TOTAL SCHOOL POPULATION in urban districts.**

● represents **10%** of **TOTAL CAPITAL OUTLAY used for URBAN SCHOOLS**

R represents **10%** of **TOTAL SCHOOL POPULATION in rural districts.**

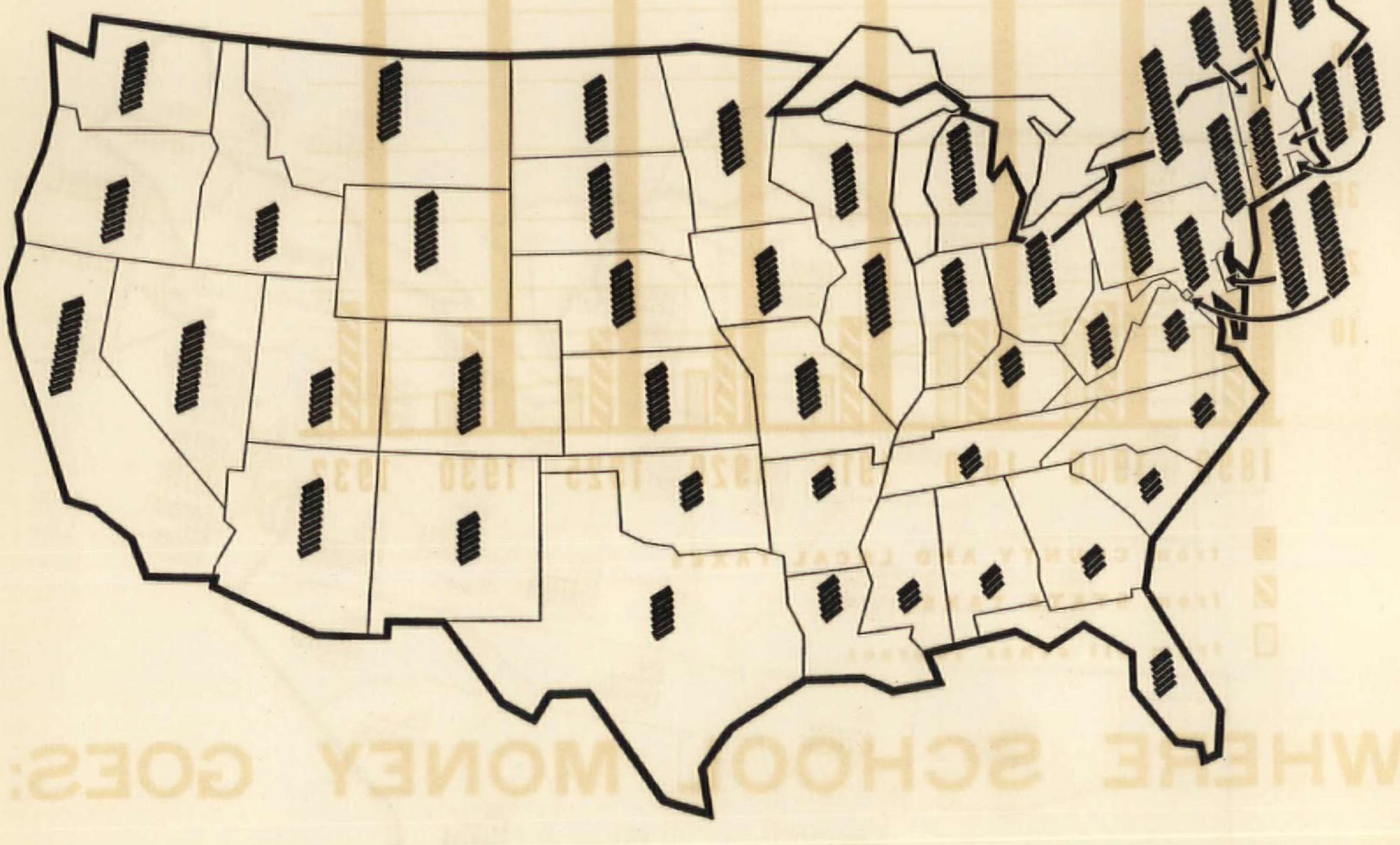
○ represents **10%** of **TOTAL CAPITAL OUTLAY used for RURAL SCHOOLS**

CHART 7

ARCHITECTURAL FORUM
JANUARY 1935

EDUCATIONAL INEQUALITIES

REFLECTED IN YEARLY EXPENDITURES PER PUPIL

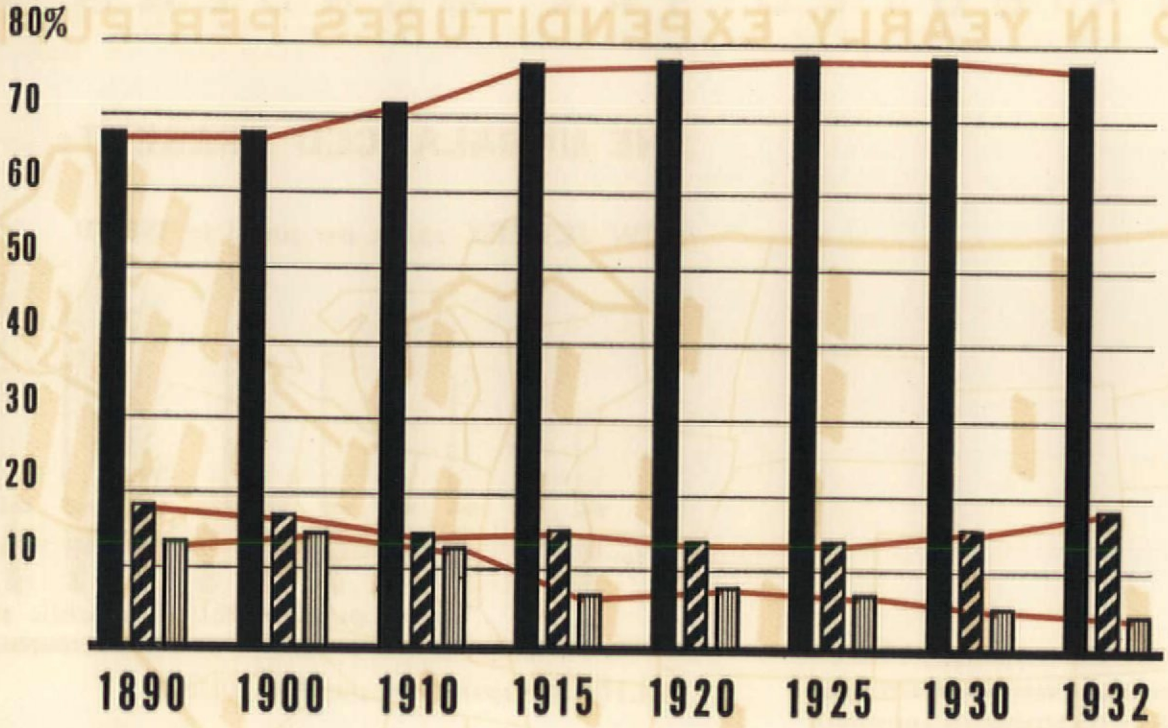


represents 10 DOLLARS of 1932 EXPENDITURES

The quality of U. S. education is in direct proportion to the ability of the various States to raise money from their citizens. This chart shows how much that is true. The pupil in the District of Columbia who receives $154 has 5 times as much money spent on him as the pupil in Mississippi who receives only $31. Yet each U. S. child is expected to share equal opportunities.

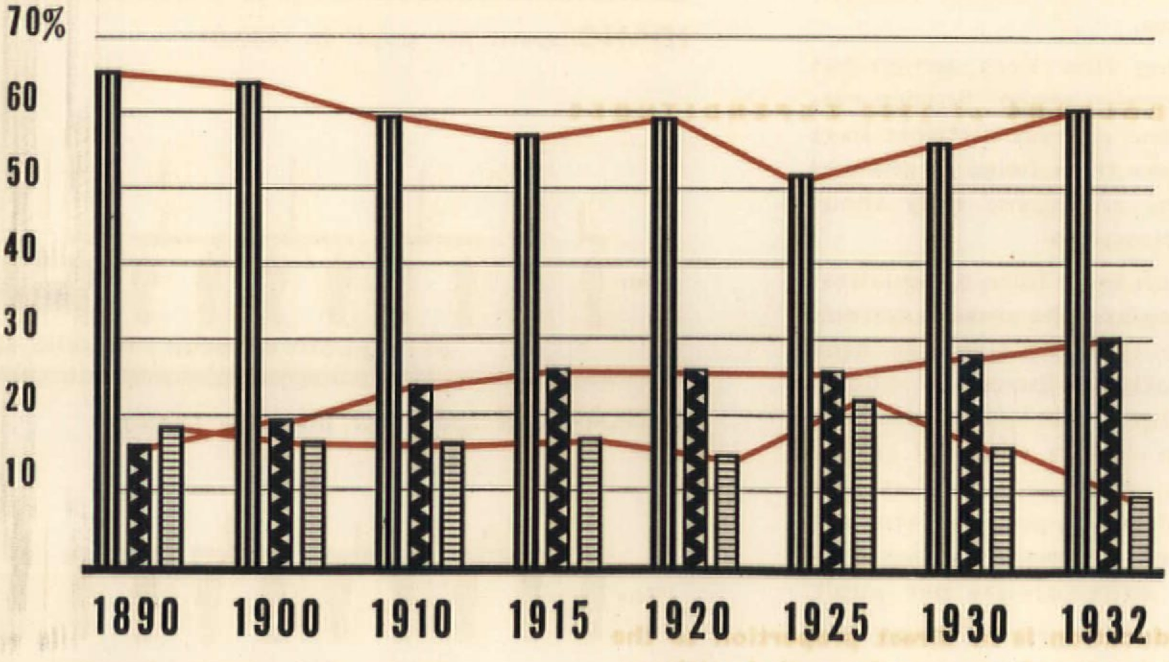
CHART 8

WHENCE SCHOOL MONEY COMES:



from COUNTY AND LOCAL TAXES
from STATE TAXES
from all other sources

WHERE SCHOOL MONEY GOES:



for SALARIES
for all other purposes
for CAPITAL OUTLAY

CHART 9

EQUALIZED EDUCATIONAL

REDISTRIBUTED TAX BURDENS BY

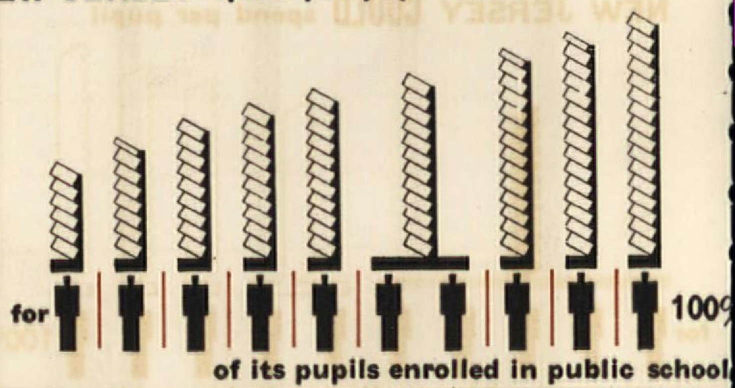
WRITTEN into the laws of a majority of States is a pledge, variously phrased but always meaning that "there shall be established a complete and uniform system of education." Consequently although the question of school support has been largely thrown upon local taxation, education is a definite responsibility of the State. Perhaps the grossest inequality arising from this condition is that in many of the districts which have the least expenditures for their schools and the most meager educational programs, the people are burdened with the highest tax rates. Yet the communities which enjoy the most adequate programs in the best of schools have the lowest tax rates.

Even in forward-looking New York, which has one of the most progressive school finance systems in the country, the poorest districts have an average tax rate more than twice as great as the wealthiest districts and spend only about one-half as much per classroom.

To correct this condition some form of equalization program must supplant the present system. No saner approach to this solution has been advanced than the National Survey of School Finance report, on which this chart is based. The survey, directed by Dr. Paul R. Mort, Director of the School of Education, Teachers College, Columbia University, proposes the setting-up in each State of an amount which constitutes a reasonable expenditure per pupil. This defensible minimum program is taken to be

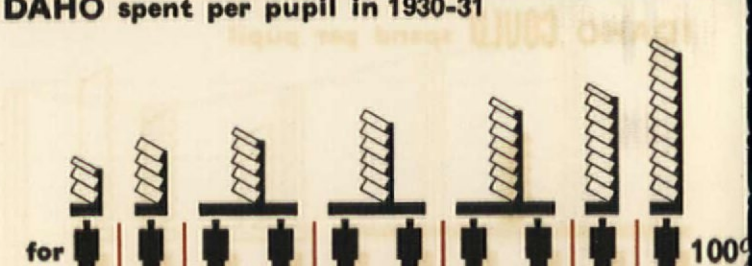
THE UNBALANCED PRESENT:

NEW JERSEY spent per pupil in 1930-31

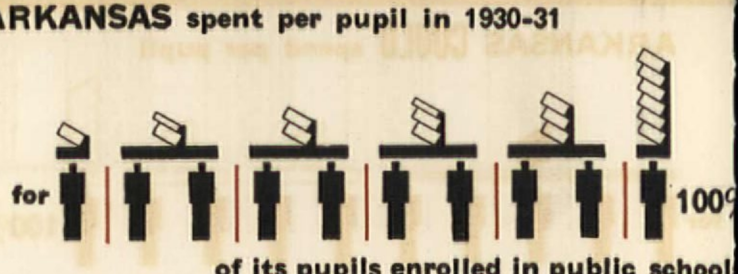


ILLINOIS spent per pupil in 1930-31

IDAHO spent per pupil in 1930-31



ARKANSAS spent per pupil in 1930-31



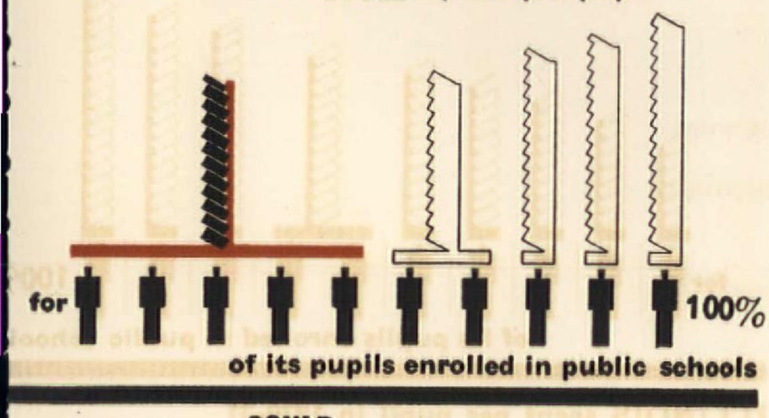

represents 10% of TOTAL SCHOOL POPULATION

OPPORTUNITIES THROUGH MAKING EDUCATION A STATE FUNCTION

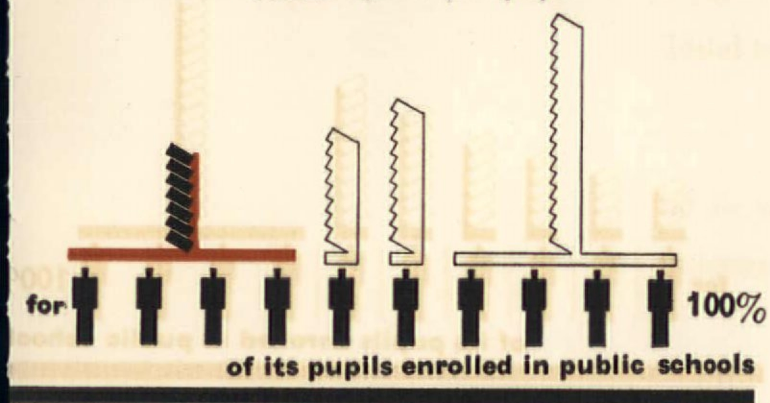
THE PROPOSED FUTURE:

AS PROPOSED BY THE NATIONAL SURVEY OF SCHOOL FINANCE, DEPARTMENT OF THE INTERIOR, OFFICE OF EDUCATION

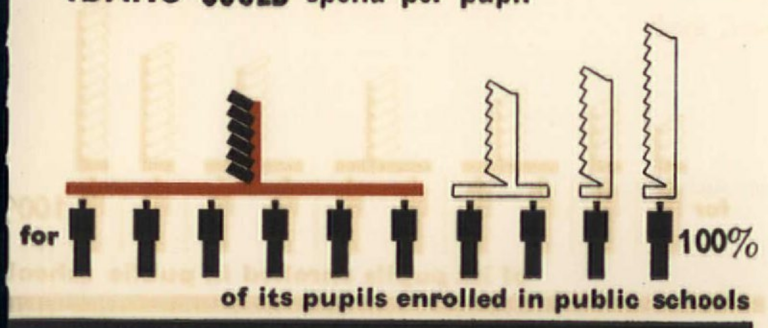
NEW JERSEY COULD spend per pupil



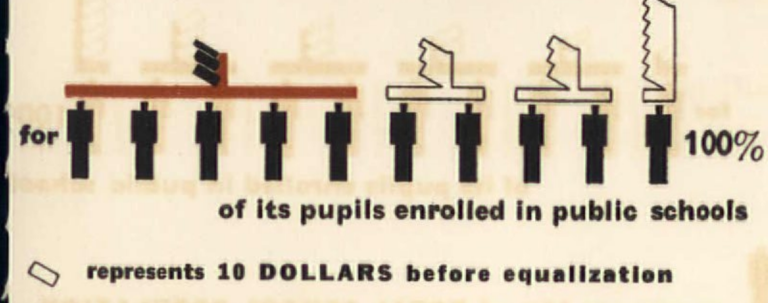
ILLINOIS COULD spend per pupil



IDAHO COULD spend per pupil



ARKANSAS COULD spend per pupil



represents 10 DOLLARS before equalization

represents 10 DOLLARS after equalization

that readily financed by a community of average wealth. It is assumed that such communities or districts are neither especially handicapped nor especially favored.

In most such districts the amount actually spent equals the average expenditure per pupil for that State.

After a defensible minimum has been established, any one of several equalization programs is to be put into operation.

The right hand part of the chart shows the effect that such a system would have in the same States. Notice the increases in the percentage of those who enjoy standard facilities.

Two methods are suggested. 1. That each District pay some part, assessed throughout the State at a uniform rate so low that all communities can pay it, while the State makes up the difference between the amount so raised and that required for the minimum program. 2. Abolition of local support and placing of the entire burden upon the State which would make a grant to each district on the basis of its minimum program needs.

The four States, New Jersey, Illinois, Idaho, and Arkansas, were selected to represent the four main geographical divisions of the U. S.

CHART 10

RECAPITULATION

CHART **1.** Declining expenditures deny proper education to the elementary school pupil, while the abolition of child labor necessitates an increase in high schools.

CHART **2.** The general level of skill of the American workman may be increased by an increase in vocational education.

CHART **3.** Increased adult unemployment has increased the problem of adult education.

CHART **4.** Not only must new schools be built to accommodate the larger enrollments of today, but also to replace buildings no longer suited to their purpose.

CHART **5-6.** The Federal Government's help has so far banished only the worst faults. And that help, continued at the present rate, can do no more.

CHART **7.** Rural schools have suffered more than urban schools. Notable exceptions like Wisconsin, New Jersey, and New York deserve emulation.

CHART **8.** Equality of opportunity, the basis of our social system, is declining in our educational system.

CHART **9.** Depression has so lessened income from property taxes that State is rapidly supplanting local support.

CHART **10.** Proper allocation of the tax budget will provide a higher minimum educational standard as a base for local initiative to improve upon.

SYMPOSIUM ON SCHOOLS

Opinions and experiences of educators, school architects, superintendents and teachers. A common complaint: the budget. The superintendent blames the architect, the architect blames the educational code. Robert Maynard Hutchins tells how Horace Mann made a mistake which he imposed upon the entire U. S.

To architects who build schools, to teachers who teach in them, to superintendents who manage them, to educators who must ponder what should be taught in them and how it should be done — The Architectural Forum sent questionnaires. Their purpose: to find out what the experts were thinking. Were the teachers and architects satisfied with the buildings the architects built? And if not, was the fault the architect's, a meddlesome superintendent's, a site too small or too hilly? And since implicit in a school building is the practice and social significance of education, what did educators, the William McAndrew's, the Robert Maynard Hutchins', think was happening or was about to happen to education in the U. S.?

The canvass, although not exhaustive, was sufficiently complete to command respect. Inquiries were sent to 254 school-building architects, to 480 teachers, 257 school superintendents, 61 top-notch educators. If no irrevocable generalities issued from the answers, at least there was here a reliable index to U.S. thought about U.S. education and there an occasional, brilliantly isolated comment. A brief analysis and summary of The Architectural Forum's symposium of educational thought herewith follows.

ARCHITECTS (Specializing in schools):

Questionnaires sent: 254. Replies: 43. (16.9 per cent.)

Does the school building you consider your most successful work satisfy you as the best answer to the problem, given the restrictions imposed?

Twenty-five architects shouted NO. For the most part, the balance offered timid affirmatives.

If not, to what do you attribute the building's shortcomings?

Even those who considered themselves satisfied with their buildings joined in the chorus which complained about limitations of budget. Regulations of the educational codes were the second most popular fault, with poor site conditions a close third. From Kearney, Neb., a good comment: "Lack of understanding on the part of 'influential citizens,' 'prominent business men,' and 'heavy taxpayers' as to the real value of a safe place in which to house their congregated children, and a place in which to efficiently train them. Good roads, industrial bonuses, and the like, are given first consideration; lower taxes, and everything else under the sun comes next, and finally schools."

A number of architects complained of interference by superintendents or Boards of Education — an interference which evidently did not extend to exterior design, for to the question relating to this point 41 of the 43 answers said that site and neighborhood plus the personal desire of the architect were the determining factors (one architect admitted that the school board chose the exterior design, another said that his budget dictated it).

In your work do you use standardized classroom units?

Only three answered no, 25 said yes, ten answered "partly." Seven architects used standardized units because their codes demanded it, the majority used them because of "economy," "flexibility," "logic." On the whole the architects appeared satisfied with standardized units as they exist today.

What are top and bottom limits of cubic foot costs of construction in schools done by you? What are the same limits of cost per pupil?

Average of twenty answers from fourteen States gave a low cubic foot cost of 21.65 cents, a high of 37.8 cents. A Cleveland architect reported 38.9 cents per cubic foot as an average for twelve schools of various types built during the last ten years. Costs in general rose from 1922 to 1929, then dropped until NRA lifted them again. Average cost per pupil from fifteen answers from twelve States was $220

to a high of $523.66. The high average was considerably raised by two answers from Chicago and Indianapolis, each reporting $1,000. Eliminating these two the high average comes down to $450.

Do you favor employment by school board or committee of technical experts on school planning?

A large majority of architects uncompromisingly and sometimes sarcastically responded NO. A few approved of technical experts for specific problems, a Denver architect considered them valuable for country projects, useless for city jobs, but the majority considered themselves expert enough, or pointed out that their firms in due course of operation would expect to employ such experts.

Do you believe that style of design, interior or exterior, has any influence on efficiency of teaching systems? Do you think so-called modern design is good or bad in this regard?

Only four architects ventured that the style design was not influential. The answers relating to modern design were interesting in that they indicated a much more complaisant attitude than would have been expected from U.S. architects a few years ago. Seven architects wrote and underscored BAD, four said GOOD and one from South Dakota said "very good." The opinions of the others varied from an interested tolerance to a desire to use modern design if it did not clash with the neighborhood. The majority of architects conceded some good to modern design if it was not "extreme," or "cold."

An architect's refrain on education: Schools of the future will be more simple and flexible; the emphasis of teaching will be on individual progress as opposed to standardized courses and mass education.

Comments: A Pasadena Architect "[The trend of education moves toward] smaller, more individual group instruction. Our Junior High School has a greater enrollment than many colleges. Children are too young for such mass treatment." From a Denver architect: "The day of public palaces is over. Our State has just built an Italian palace as a dormitory for freshman girls who largely come from the farm. Will they be satisfied to go back to the farm? Hardly. The trend will be toward consolidation, fewer districts, efficient but simple plants." A Philadelphia architect: "There will be emphasis on better lighting with less dependence on natural light."

A Hutchinson, Kansas, architect: "The school building should be so substantial that it would be the safest place in the community at times of storm, or earth tremors, and should be a refuge from fire."

TEACHERS

Questionnaires sent: 480. Replies: 35. (7.5 per cent.) Although complete anonymity had been promised.

Are you satisfied that the school in which you teach is the best possible plant for the town, district and pupils?

Thirty out of 35 answered NO. Plan and design were the most frequently mentioned reasons. Heating, ventilation, location and lighting came next.

Fifteen out of 25 teachers did not favor the use of standardized classroom units.

Sixteen out of 21 believed that design (as separate from planning) greatly affected the efficiency of their teaching.

Fifteen considered modern design good, four were in favor of it with certain reservations, none declared it completely bad.

A majority considered their classrooms, although imperfect, used to their maximum efficiency.

A school teacher's refrain: Let there be more light.

Comments. From a Washington, Pa., teacher: "As I inspect a number of school buildings built during the past ten years, I find that the greater part of the building is given over to the gymnasium and the classrooms are stuck around the edges. I find so many corridors so dark that you could not read a newspaper even if the day is clear.

"Stairways are frequently not large enough and form a bottle neck when classes are passing.

"The administrative headquarters frequently occupy the best and largest space in the building. The child should come first in planning."

From a Modesto, Calif., teacher: "The architect should recognize that he is not a school man and therefore consult classroom teachers — not always principals and superintendents."

From a New Jersey teacher: "The point is that methods of teaching have changed so radically in recent years that the typical old-fashioned classroom is entirely unsuited to modern needs. Very few rooms, even in Math., need every wall covered with blackboards. But we do need plenty of cork bulletin boards. Our rooms have plenty of the former, hardly any of the latter. The modern classroom needs book shelves galore, some more than others. It needs lots of closet space for storing mimeographed materials. The average room has a mere book closet. It needs tables and filing cabinets, movable desks, etc. Some rooms should be big; others small. There should be conference rooms, lecture rooms, small study and consultation rooms. Teachers need little rooms for consulting small groups or individuals. Our personal advisers have to meet their 'clients' in the mens' and ladies' rooms in the absence of better places."

SUPERINTENDENTS

Questionnaires sent: 257. Replies: 65. (25.2 per cent.)

Are you satisfied that the newest schools in your district are as good as they could be?

No: 27. Yes: 18. Yes with reservation: 12.

If not, to what do you attribute the building's shortcomings?

Like the architects, the superintendents' first answer was limitation of budget (26). But, unlike the architects, their second answer was "failure of the architect properly to understand the problem" (16). Poor site conditions made a poor third.

Do you believe in standardization of classrooms?

Yes: 26. Yes with reservation: 15. No: 13.

What style of design do you ask for, or is that left to the architect?

That the architect remains master of his styles was indicated by a majority of 46 who left the choice to the architect. Ten superintendents demanded special styles.

On the subject of modern design seventeen were in favor of it, twenty-two liked it with reservations, seven disliked it.

A substantial majority of superintendents considered their buildings "maintained in good condition," although one, in Boston, pointed to the fact that one of his was 134 years old. Poor construction and improper selection of materials were the chief reasons for poor condition.

Do you believe in employing a technical expert in addition to the architect?

Yes: 20. No: 18. Yes under special circumstances: 4.

How do you select the architect?

"In past years he was selected because he had four friends on the Board of Education."

"Direct appointment by the Board."

"Choose a local man with a good reputation."

"By Board of Education — too often by a kind of competition of compensation asked."

A school superintendent's refrain: limitation of budget.

Thus the architects who build the buildings, the teachers who teach in them, the superintendents who manage them. If the desires of today are the facts of tomorrow, somewhere in the answers to these questionnaires rests a hint as to what future U. S. schools will be.

But what will be taught in tomorrow's schools? And what, if anything, is wrong with today's system of primary and secondary education?

It is the educators who should answer.

EDUCATORS

Letters sent: 61. Replies: 29. (48.3 per cent.)

With pleas of ignorance or preoccupation with business or with secretaries' explanations of trips or lecture tours, most educators evaded the questions. To those who did not The Architectural Forum's thanks for giving thought and utterance to what should be an educator's chief concern and favorite subject and what is one of the most vital problems in the U. S.

Walter B. Pitkin: "Here are a few of the most important trends that must drastically change location, design and planning tomorrow's high schools.

"1. Whatever else is to be done about tomorrow's schools, one thing is sure. They will be much cheaper structures than the old extravagant sort. It is stupid to build million dollar palaces for thirty-cent people, even if you have a million dollars. When you haven't the million dollars, then there is no problem at all. The architect who will contrive a good cheap school building will get plenty of orders pretty soon.

"2. In the next decade, we shall need hundreds of new high schools. As business and industry move offices and plants away from overcrowded, overtaxed metropolitan centers to pleasant, relatively inexpensive regions, existing small towns and rural communities will grow, and wholly new communities will be established. Furthermore, the number of jobs in production fields will continue to decrease relatively available workers. Adults will bend every effort to keep young people in school until they are at least eighteen or twenty, in a desperate effort to ease terrific competition. These two trends alone will require the building of hundreds of new high schools outside our largest cities.

"3. Tomorrow's high schools must for the first time become integral parts of community life. The high school today has little relation to the real world. It is an expensive greenhouse, supported by the taxpayers, devoted to the nuture of useless hothouse products who lack initiative, skill, persistence and well-developed self-sufficiency. The taxpayers will no longer support these parasitical institutions. They will demand results, or else. . . .

"What does this mean to the architect?

"The classroom (except for purely cultural study) is obsolete. It must yield to the workshop. I mean this in no narrow sense of the ordinary trade school. Rather do I mean that high school students will begin in their early 'teens to be trained to work on a professional level.

"Under competent supervision, they must master the techniques of their chosen careers. They may have to experiment for months or even a year or two to discover the careers for which they are best suited. And then they must select among these only those fields which are not obsolete or obsolescent. To discover promising opportunities is one of the major tasks of the high schools. But it is related only indirectly to the architect's problems.

"Architects, then, must be prepared to plan new types of school workshops. To go into detail on the planning would require a volume.

"4. Adult unemployment and the increase in leisure hours will widen the scope of high school training. High schools must be equipped to perform two new services for adults: first, they must help to retrain adult workers who are technologically unemployed for new opportunities that will at least pay them bread and butter; secondly, the schools must go further than ever before in educating people young and old for busy, interesting leisure.

"Thus the high schools become retraining and recreational centers. Architects must be prepared to meet these new needs.

"5. It is very likely that in some parts of the country the high school will become more and more the community center. There might be great economies in what we might call 'merger high schools.' The buildings would be designed and equipped as workshops, adult educational centers, recreational centers, little theaters, and so on. The possibility deserves careful study."

Robert Maynard Hutchins, President, the University of Chicago: "The responsibilities now laid upon schools are such that an attempt to meet them with the three R's would be as futile as trying to deal with the economic situation with the slogans of Harding and Coolidge. . . .

"With billions appropriated for dams, trees, roads, post offices, courthouses, and even warships, not a word has been said about schools, schools the construction of which would provide as much construction as battleships, if construction is what you want; schools which might eventually give us an intelligent nation. . . .

"The elementary school term is eight years for no better reason than that Horace Mann when he went to Germany to find a school to imitate, imitated the wrong one, and imposed on this country as a preparatory unit a school that was terminal in its native land. The high schools are largely dominated by collegiate requirements that have no application to the majority of their students. The junior

colleges are frequently two more years of high school or pale imitations of the first two years at the State university. The colleges of liberal arts sometimes seem to duplicate the high school at one end and the university at the other. The universities are weird mixtures of general education, specialized study, professional training, and college life. If we are ever to alter the public attitude toward education we must clarify the functions of all these organizations in their relationships to one another."

Virginia C. Gildersleeve, Dean of Barnard College, Columbia University: ". . . our American education at the present time seems to me chiefly lacking in thoroughness, and, in its high school state, in unity and point. The general feeling is, I understand, that our primary education is fairly good, and our high school education pretty poor, being often fragmentary, disconnected and superficial. . . .

"I presume the chances are that our changing economic and social conditions will result in having more pupils continue their education up to the age of, say, eighteen. We shall therefore have to provide more types of secondary education. I think that handicrafts and the fine arts will play a prominent part. . . ."

William McAndrew, Editor, *School and Society;* "The nation as a whole has never, as Washington said it must, considered the educator of primary importance. He has been beneath the money-maker, often underpaid, usually regimented under petty political control, seldom given assurance of continued employment in prosperous times. . . . In spite of all he has advanced education in America during the past thirty years more than it has progressed in the whole previous history of the world. The mass of the people are now for him, but they are unorganized. The small and powerful groups whose children are too choice for public school education are attempting to cut away his underpinning. As I see it, he is continuing to win. . . ."

Henry Pratt Fairchild, Professor of Sociology, New York University: "From the architectural point of view one improvement that certainly ought to be made in our public school buildings, as well as practically all other public buildings, is in ventilation. It may be that with the new era of air conditioning this will be taken care of in the near future. If so, it will make me wish I had been born fifty years later."

George Simpson Koyl, Dean, the University of Pennsylvania: "It should be emphasized that congestion is not a proper condition for primary or secondary school education. If we compare the maximum size of schools in Germany where six and seven hundred are the outside figures, or schools in the city of London where five and five hundred and fifty are the maximum with our ten thousand, as in the DeWitt Clinton High School of New York City where there are pupils of every age, color and nationality, some conception of the situation may be realized.

"Therefore, it must be urged upon our boards of education and other responsible persons that there should be a limitation of size and instead of awkwardly large units there should be a multiplication of smaller units to provide for the ever increasing numbers of pupils, augmented now by thousands of children thrown upon the school systems by the passage of the Child Labor Law and the absence of employment opportunity. Since the law ceases to operate at these ages a vast army of young Americans unable to go to college or to find work are let loose on society. Unemployment has resulted in notable additions to the criminal class from this group — a social problem of magnitude and importance, unsolved excepting as the radio and the movies have created recreation and some measure of education for the adult able to afford them.

"The decentralization movements brought about by the rehousing for low-income earners, subsistence homesteads, redistribution of industrial plants and by the normal desire of city residents for suburban life where light and air are plentiful, as exemplified at Radburn, N. J., indicate also a decentralization of educational facilities in the future. Architects will be definitely involved in providing structures flexible in plan to meet rapidly changing schemes of instruction, as indicated in the tendency away from "formal classroom" activity to the "participation in life" activities. Rooms must be adapted to many uses for pupils numbering from thirty to two hundred. The library will continue to grow in importance and the cafeteria likewise, in which mass feeding needs a more orderly control that health and manners may be integral parts of education. Unbalanced diets and overcrowding are malicious in their effect upon social training.

"One word as to esthetics: while the architect must build simply and well, his duty to society will not have been fulfilled unless he provides structures which not only satisfy their predestined purpose but which pay homage to the beautiful. Without overelaboration the modern school building should tend to elevate the minds and spirits of the child to the realms of the ideal."

Angelo Patri, Consulting Educator: "Primary classes are too big. Courses of study are too rigid. Teachers have little chance to express creative power in teaching. Children have little opportunity for making their own peculiar growth. The individual is massed with his fellows and that is not the way to rear a generation of intelligent self-reliant people.

"As I vision the future and long for a school that might help it ahead, I see new buildings, new courses of study with new aims, new programs administered toward new ends. The new school must be a fluid thing, because life is fluid.

"All this means new types of building. Little children ought not to climb stairs. Their building ought to be long and low with many easy entrances to the yards and playgrounds. The classroom units ought to be devised so as to allow them to be increased and decreased in size, according to the need of the period. There must be more play space. The bathing and washing facilities must be made adequate. Imagine thousands of children in a building, hard at work, with no opportunity to wash their hands and dry them We have that condition today.

The upper grades need the same adjustable rooms. They need too, and this is a positive essential, a whole series of shops, studios, laboratories, libraries, play spaces, stage and lightings, all the activities that life demands must be housed in the school and made easy to reach by the children who can use them."

Lewis Raymond Alderman, Director of the Educational Division, United States Office of Education: "I believe that the newer schools will provide rooms for adults where chairs and tables will take the place of seats screwed to the floor. Child labor laws will undoubtedly make it necessary for more children to stay in school. The subsistence homesteads management will take pains to see that modern school houses are provided for these colonies."

SCHOOLS OF TOMORROW

IN THE

UNITED STATES

A series of architectural studies prepared for THE ARCHITECTURAL FORUM under the direction of Richard J. Neutra, W. Pope Barney, William Lescaze, and Wallace K. Harrison. These show the school organized within itself and integrated with the needs of the community.

FOREWORD

By

ARTHUR B. MOEHLMAN

Professor of Education, University of Michigan, Editor, The Nation's Schools

THE school buildings in any community are tangible and concrete. They represent the use of land and building materials formed into permanent structures. Many of them are large and not easily hidden. They stand day and night as physical evidence of an activity and of an ideal. They are part of the total community social effort. Their character, extent, and type will be determined at any time directly by the educational policies in operation and the number of children and adults to be instructed or cared for in other ways.

The field of public educational activity within a community is complicated just to the extent that life has become complicated. Education is the means by which each generation is adjusted to the environmental conditions under which we must live. So long as we desire to maintain the democratic way of life, on which all of our growth and development since the birth of the nation has taken place, it is fundamentally necessary to provide for public education in accord with the needs of each generation. So long as social change continues, public education needs will also change, for they are at all times only a reflection of community life about us.

In the past the teaching profession has taken a rather narrow view of educational activity and has envisioned it as concentrated in the public school plant. This is far from true. Education of child and adult go on constantly and many agencies contribute to it. The home, the church, the community life in general, and commercial recreation agencies all contribute directly to the individual's education. Even a classification of all institutionalized public educational agencies would today include, in addition to the public school, our libraries, museums, art institutes, zoos, public auditoriums and concert halls.

These are all definitely represented in our larger communities and assist in providing the possibilities for a fuller and richer individual life. In our small centers, they are quite generally neglected and thus restrict the opportunities for the necessary enrichment of public education, so essential to present day conditions.

In like manner as leisure has increased and our urban territories more closely built up, the need for recreation and for breathing space has become more important. In recent years increasing emphasis has been placed on the need for recreational facilities, including both parks and playgrounds.

It is necessary, therefore, in any rational planning for education during the current and succeeding decades to orient adequately the problems confronting us and to plan

for their solution in a sensible and consistent manner. Planning presupposes the existence of power to see all of the problems and to be willing to engage in the effort essential to their solution. Since most of these problems are very complicated and involve many groups of interests and many different technical factors, the second essential of planning is a recognition of the cooperative nature of the work and the ability to work harmoniously with other active and sometimes aggressive interests. The third problem in planning is one of making the people realize the need for the plan and maintain a rational public opinion with respect to it. Only by intelligent social leadership, complete cooperation with parallel technical interests and with the people as a whole, will it be possible to provide economically and effectively for a satisfaction of these needs.

Comprehensive planning may be started by the appointment of a planning commission which includes all of the interests in a community, empowered to employ technical specialists to determine scientifically the totality of community needs. It is next possible to organize these needs around the several types of social organizations already in existence. A total inventory of the educational needs in any community may be administered in a variety of ways. In large urban centers it may possibly be desirable to provide separate administrative control for schools, public libraries, art institutes, museums, zoos, and recreation facilities, provided there exists some means of correlation so that all of these activities will really serve the people. In smaller communities, however, it is distinctly possible and highly desirable to bring all of the educational agencies under a single, well-coordinated control so that needs may be served economically and efficiently with the least possible amount of duplication and overlapping.

The educational requirements of our several States are changing so rapidly today that the current dominant type of school plant is no longer representative or adequate for the present, let alone the future. One of the important problems facing the Government is the reconstruction or reconditioning of at least 90 per cent of existing plants. As we move into the Age of Power we are faced with the problem of providing education for the children that is much more complicated and involved than in the last generation. This fact is due to the development of the science of education and to the complications of the world in which we are now living.

Since the purpose of education is to prepare the child for effective social living, all of these major economic and social changes will result in corresponding social change in our schools. The next few years will see many changes and developments in the curriculum, in methodology and in administration. We are face to face with the problem of what to do with adults. Not only will it be exceedingly difficult in the near future for children under twenty years of age to secure employment but our active adults, twenty to fifty-five, will have much more leisure. The twenty-five hour week is just on the horizon.

Provision must be made for exercise of this leisure and for the continued education of adults both for vocational and recreational ends. It will be necessary to provide means whereby the local neighborhood groups can meet regularly in their schools for the study of governmental and local problems, for play and recreation, for means of expression in the shops and in all of the fine arts laboratories.

What may be expected then from this school plant of the near future?

In the first place the future plant must have larger sites. Twenty acres will be the minimum for elementary schools and forty acres for secondary buildings. The reason for this essential increase in the size of site is that the neighborhood school will be obliged to provide recreation space for both children and adults. For this purpose in a territory at least one mile square twenty acres represents a very minimum. The new site must also have space so that the building may be adequately landscaped and screened from the street and the neighbors. Many of the schools' troubles have grown out of difficulties that playing children provided for the neighbors. Noise and other annoyance of the school site may be also completely eliminated by the proper use of planting for screening purposes. Incidentally, a school site that looks like a park will increase surrounding property values rather than diminish them.

The school site will also have a garden and conservatory where flowers and other desirable plantings may be propagated by the community as an incentive to home gardening. A botanist or school gardener will provide leadership for the development of home gardening for the sheer pleasure of watching things grow and reveling in the gorgeousness of nature's rich colorings. On summer evenings the children and adults of the neighborhood may bring their instruments for good music in that part of the site set apart as a grove. An outdoor theater will also provide means for neighborhood pageants and theatrical presentation. Each school site will offer abundant means for individual group expression and for the constructive use of leisure in favorable weather.

More fundamental changes will take place in the building itself. As stated earlier, a building is merely a concrete expression of teaching needs and teaching practices. The minute divisions of subject matter will probably disappear in the very near future to be more generally succeeded by six major divisions, each of which provides for continuity from the preprimary years through the junior college or higher secondary education. These will probably include: health, languages, social studies, exact science, fine arts, exploratory and directly vocational activity. Provision must be made in each building for training on the adult level as well as on the child level.

These curricular changes will greatly affect the typical school building of today. Most of them may even now be found in progressive centers.

To provide for health education there will be gymnasiums, swimming pools, sun rooms to secure the benefit of the ultraviolet rays, rest rooms, cafeterias, dental and medical clinics. Specialized units will have apparatus designed to assist those unfortunates who have been crippled by disease or accident. Every means to enable a child to develop a healthy physical body will logically become a part of the school plant.

On the instructional side many changes will take place. There will tend to be more specialized classrooms and more small centers where children may work individually and in small groups. Instead of segregating the hard-of-hearing, the partially blind, and those of low mentality, provided they are stable emotionally, these atypical children will be given their training with specialized physical facilities within the community school. Since these youngsters must learn to live with people who are free from physical and mental defects, they must learn in school to adjust to each

other, instead of growing as social misfits because of segregation. There are many social activities in which the entire group may participate, and special classrooms and apparatus may be supplied to meet their peculiar individual needs.

Since much of the success of the new schoo will depend on how much the teaching staff knows of the individual child in his many and diverse aspects, there will be provision for many clinics in our new buildings. These will include clinics for dental, medical and neurological investigation and care, and clinics for psychological, sociological and instructional investigations. Children will not compete against each other in terms of the old mass instruction, but achievement will be measured on the rate of growth possible in terms of his own inborn capacities and potentialities. Children who do not learn easily or who show great variations in learning will not be dismissed as in the past because they annoy the teacher, but will be studied by medical, psychological, endocrinological, educational and sociological specialists to determine cause and to provide remedies.

For the social sciences in the typical community, provisions must be made for small but effective anthropological or cultural museums where material showing the economic, social and ethical evolution of man may be displayed and constantly used as visual accessories. In the exact sciences, there will also be provision for many visual exhibits, including the fields of physics and chemistry and that of biology. In the natural sciences particularly there will be provision for small but carefully chosen zoos through which the children may study the life cycles of various animal forms and types.

In fine arts, the curricular division whose object will be to provide means both of individual appreciation, esthetics and self-expression, there will be a great extension of facilities. Laboratories for drawing, ceramics, metal work and modeling will form a necessary part of the adult's work as well as that of the child. There will be an art gallery in which copies of the treasures of the ages may be shown. Whether these exhibits will be carried in the corridors and rooms or provided in special rooms will depend largely on local policy.

Auditoriums or little theaters will be essential for adult as well as child activity. These rooms will also be used for community meetings, for social and political forums, for the school of the future must provide means whereby the political education of the entire community can be carried on continuously. No longer will it be considered desirable to exclude political discussion from the schools because of "bad influences upon the children." Instead, each school building will become a laboratory in practical politics and will serve as the primary unit in political activity.

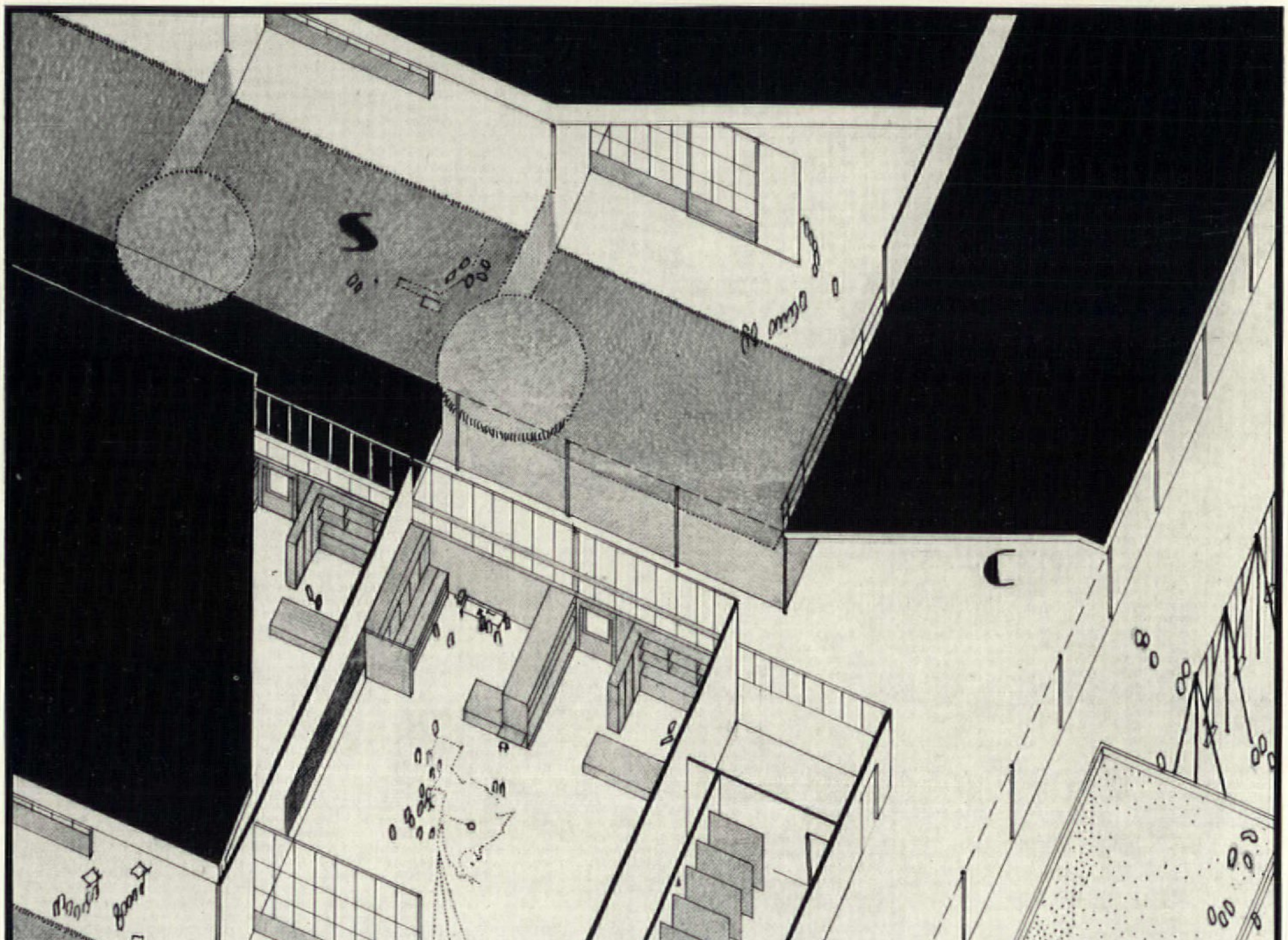
While the emphasis will probably be shifted from directly vocational to prevocational and exploratory courses in the shops, there will be an increase in these mechanical laboratories. They will serve as means of expression both for adults and children. Here child and adult will be enabled to express themselves in wood and metal and to carry on their manual hobby activities. Opportunities will be offered for small groups to work together on individual and group ideas.

Last of all, but decidedly not least, is the need for an adequate library in every school, officered by a teacher who is a librarian only in a secondary sense. Her primary activities are concerned with the direction and stimulation of reading tastes. The library should be one of the finest and most attractive rooms in a building with plenty of quiet corners (and an open wood fire, if possible) in which to read for sheer enjoyment. The shelves should be filled not only with reference books but also with the finest printed expressions of that which marks the best creative efforts of men in all countries and in all times. Each of these libraries should be specifically provided with one section of books bearing on parenthood and intelligent living within the family.

Finally, every school building of the future should be designed by educational specialists around the curricular and extracurricular needs of the child and adult community. Only after these needs have been completely met can architect and engineer take hold and perform their specialized work of designing the construction. Every building must be located on the basis of facts determined by actual community survey of need. It should be built on the assumption that it will serve for at least fifty years. All of the construction material must therefore be selected with respect to lasting qualities.

It is always well to remember that the cheapest building in erection cost may be the most expensive in upkeep cost. The use of marble and tile in corridors and toilets, generally criticized as extravagant, over a period of twenty years will prove to be cheaper than any other material. It is not extravagance to build for quality. There are no bargains in buildings. The necessary adjustments to extremely flexible and complicated instructional programs in the future will result in a lower daily use of school facilities in terms of the total number of stations in each building. A school building must always be considered as a physical agency through which the community's social, political and esthetic needs may be satisfactorily met, never as a separate entity.

One word of caution! Many of our present difficulties are due to the manner in which school buildings were financed through long term borrowing in the past. Depressions will occur again. It is therefore necessary to keep our credit clear so that we may save our borrowing power for times of need and operate our schools at full power during depression periods. The best solution for financing buildings is to go on a complete pay-as-you-go program. Since present school districts are much too small for this policy the State should provide for the financing of the public school plant through moneys raised by current taxation. Here is an excellent point to start with Federal aid. Present school district indebtedness should be wiped out as soon as possible to prepare for the next period of need.



THE IN-DOOR OUT-DOOR CLASSROOM

S. Out-door classroom

C. Concourse walk

T. Toilet group

P. Play yard

RICHARD J. NEUTRA, ARCHITECT

NEW ELEMENTARY SCHOOLS

FOR

AMERICA

. . . The redesigning of the basic unit of education—the individual classroom—as a necessity.

By

RICHARD J. NEUTRA, A.I.A., Z.V.

In several European countries the educated part of the population, the intelligentsia, has suffered a marked decline in the esteem of the people at large and has been judged unable to make its valuable contribution to a unified plan of guidance in practical public affairs. General cognizance was taken of its lack of group initiative and cooperative qualifications. Dictatorial governments found a certain justification for wholesale suppression and even expulsion of that social stratum which by merit of its mental training should have been expected to prove the most helpful agent in any constructive reform. Acquisition of extensive theoretical knowledge results by no means automatically in well-integrated, cooperatively directed practical action.

An educational procedure toward just this fertile end will have to focus its interest on those first years of schooling, where great plasticity of mind and of social attitude exists.

The kindergarten and the elementary school, particularly the lower grades, have therefore been recognized as the necessary stage for the first and most consequential act of educational reorganization.

Nora Sterry, a successful educator of the West Coast, and a member of the Los Angeles County Board of Education, describes the traditional "listening school" as having "classrooms with four substantial walls, floors, ceiling, windows and some provision for heat, light and air. In these schools the teacher does the thinking, planning and initiating, while children sit passively accumulating information about the world in which they live." Such a school might in former periods have served to supplement the busy lives of children, who in off-school hours cooperatively shared in the simple activities necessary to provide food, clothing and shelter for the family group. These children (for example, on a farmstead) acquired experience at home in working with others, in overcoming practical difficulties, in learning the value of work and the worth of things about them.

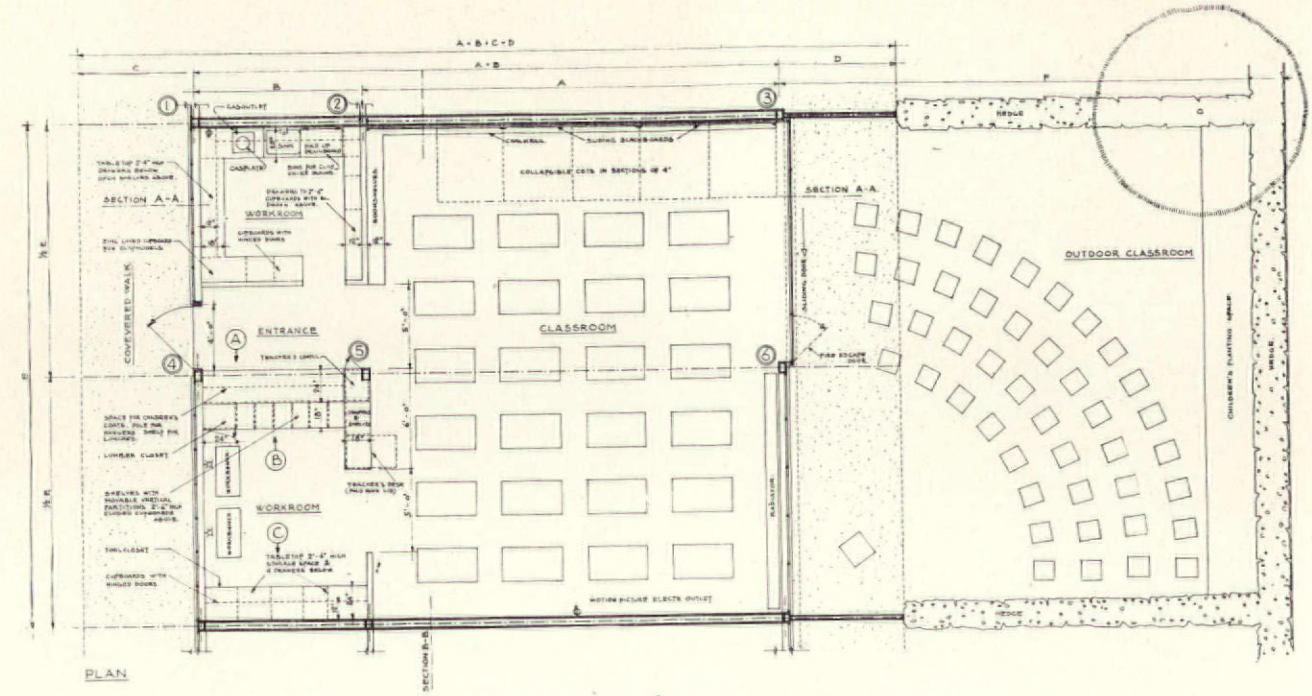
"School, then, supplemented and completed this real learning-through-living, by teaching the three R's; that was all society demanded of the school."

Those instructive *combined* efforts of the family group have dwindled under newer economic and technological conditions.

The modern active school has to take over the responsibility for such education, where the solving of practical problems, the working together, the sharing with others and considering the welfare of others becomes a concrete experience and where the children do not learn, through reading and listening alone, what others have done.

The conclusion is that school buildings, planned as places to acquire facts through motionless receptivity, defy every effort of administrators and teachers to meet present demands of progressive educational practices.

The redesigning of the *individual classroom unit* as the basic element of the school plant thus becomes a primary necessity. The truly suitable orientation and coordina-



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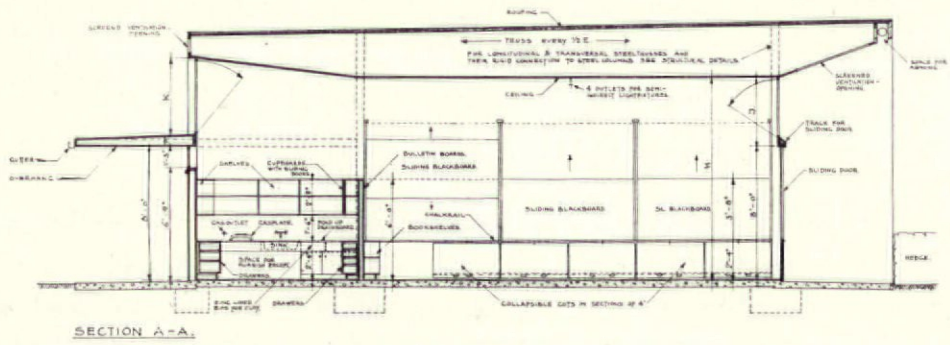

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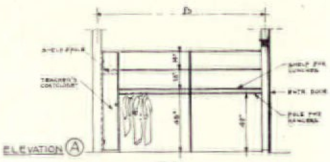

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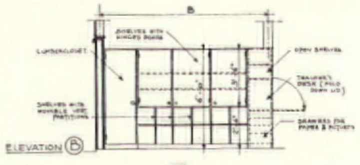

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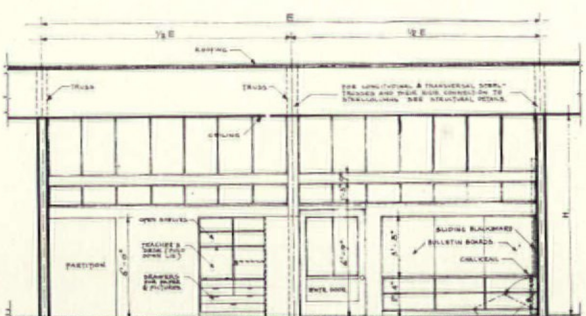

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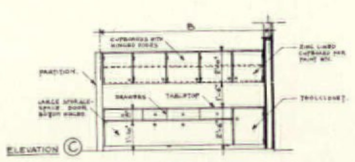
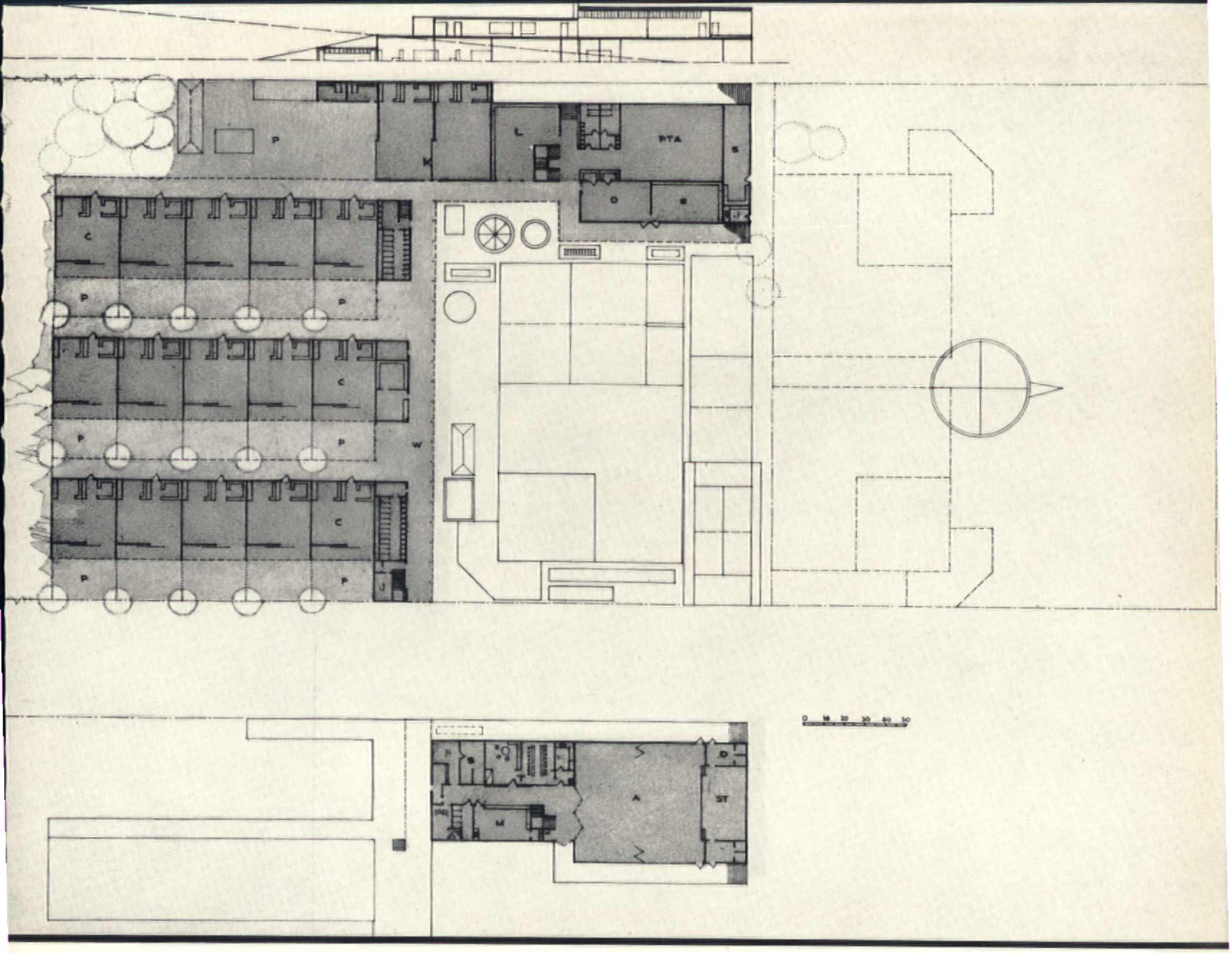


F

TYPICAL ACTIVITY CLASSROOM

A. Plan of classroom unit
B. Longitudinal section
C. Cross section
D. E. F. Details of wardrobes and shelves



Typical plan and plot plan as proposed for Lawton Avenue site in San Francisco. C. In-door classroom. P. Classroom patio, or out-door classroom. O. Opportunity room. K. Kindergarten. W. Concourse walk. L. Library. PTA. Parent-Teachers Association. A. Auditorium. ST. Stage. D. Dressing room. T. Teachers' hall. PR. Principal's rooms. F. Front office. M. Mental and dental examination room. Anteroom with hygiene exhibits. T. Teachers' lunch room, rest room, kitchenette, S. Storage room. J. Janitor's room.

tion of these units in an integrated plan is a problem which offers itself simultaneously with the first one.

Daylight from both sides into the classroom for the purpose of a free and flexible seating arrangement automatically does away with interior corridors because it requires main windows toward two sides, preferably east and west. Outdoor working space attached to each individual classroom means the abandonment of multistory layouts and relieves the plan of stairways.

Stairways and corridors have been the cause of many disciplinary difficulties, of unsuccessful supervision, of costly fireproofing provisions — but their elimination and the reduction of the school plant to a one-story structure seem to call for an increase of plot areas.

This latter condition appears unduly hard to fulfill in congested metropolitan districts. But then it is a consensus of authoritative opinion that such districts are gravely obsolete and an unsuitable environment for conditioning the behavior of small children. If congested dwelling sections cannot be counted out for the moment, it is at least an urgent and, with certain sacrifices, a possible improvement, to balance somewhat their evil influence by attaching to them neighborhood portions of a green belt and there locating uncramped and unmutilated that public provision which is intended to mold favorably the minds and social skills of the next generation: the kindergarten and elementary school.

Economy in school construction must and can be effected in other ways than by restricting plot sizes. Such a land investment, while outside the competency of school boards and more a matter of general reform in community planning, will doubtlessly bring striking returns when the next generation has grown up to adult activity.

Space for the school plot—especially in antiquated urban neighborhoods—should not therefore be made an issue of compromise. Play yards and physical training grounds are the more a desirable ingredient of the community layout the denser the population and dwelling habits. Their full value properly considered, they are one of the most effective anti-slum measures.

The School Housing Division of the State of California and the Regional Planning Commission of Los Angeles County advocate for the elementary school a plot size of five acres. The increased significance of these schools as centers also for the neighborhood community life of the grown-ups thoroughly justifies this recommendation.

A good deal of adult education, social and physical culture and welfare, and of parents' and teachers' activities for the district are being attached to the elementary school plant and increase its functional scope. The spotting of elementary school plots over a metropolitan map becomes a primary and most fertile issue of communal planning and should influence in a marked degree the relation of traffic arteries to neighborhood quarters.

In decentralized types of suburban colonization, where by necessity school-walk intersects with rolling traffic, *bus transportation* of children will grow to be an integral part of the system, facilitating the creation of full sized school plots and useful green areas surrounding them.

With a settlement density of twelve to twenty families per acre the tributary area for the school of 500 pupils will be 1 to 1¾ square miles.

In the future it may well appear feasible and indeed a measure of true economy to develop certain types of elementary schools fitted to the conditions of rural, semi-rural or suburban districts which could be largely shop-fabricated and extensible. Such structures, strictly living up to the program worked out by the State division of schoolhouse planning, or by a committee of experts of all pertinent categories, would then in their elements be furnished from the manufacturing plant and speedily erected by crews on the premises. A unified educational procedure seems to be even more benefited by well-tested and type-determined plant layouts than it is by tested and type-determined text books which we now have. However, before such a high quality series production of elementary educational plants could ever be considered the testing and exemplary action is in fact *the* urgent step toward progress in this most consequential field.

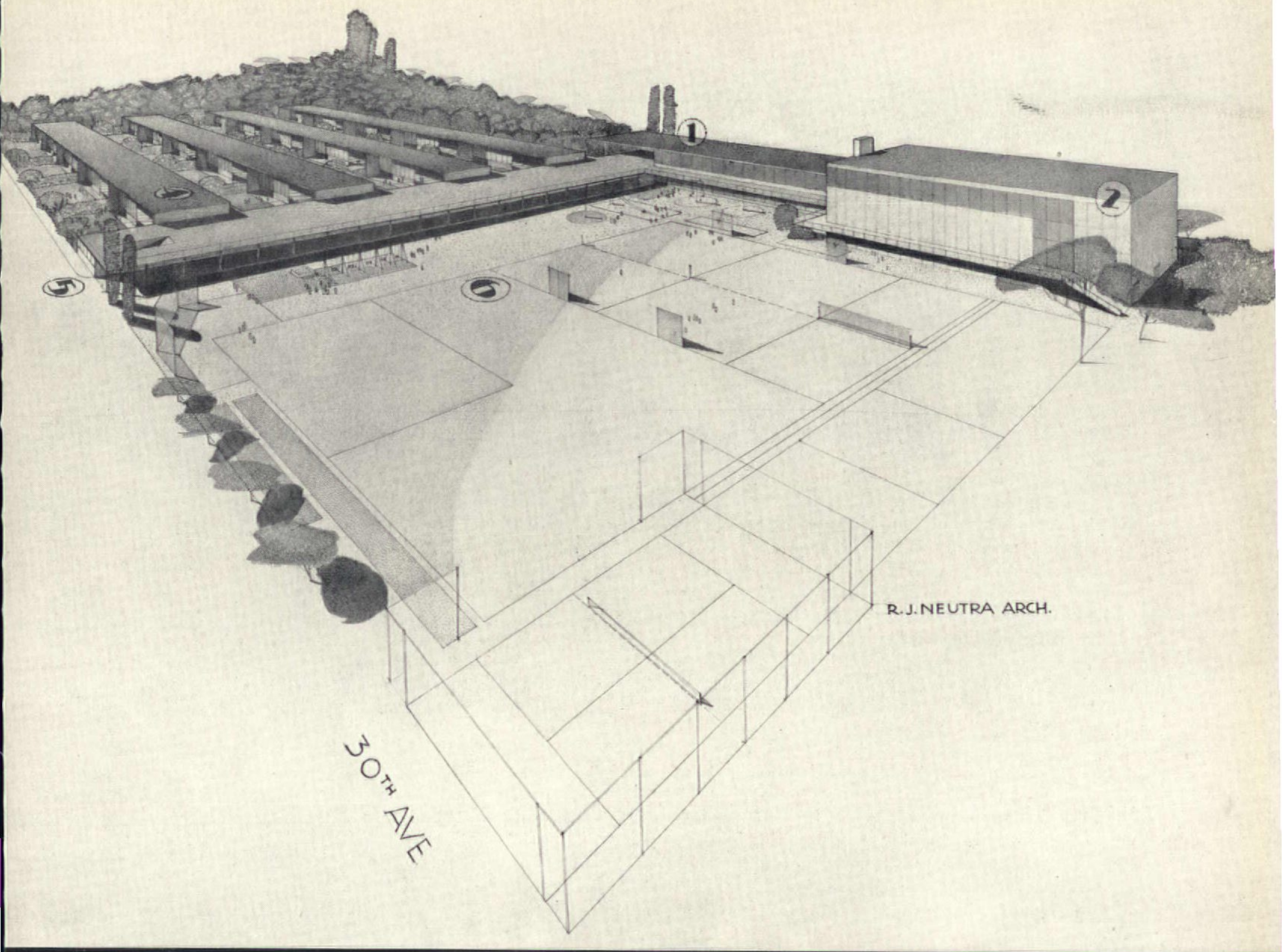
While the largely prefabricated "Ring-Plan-School" illustrated in this issue (first published in 1929 *America. New Building in the World*) anticipates such a future development, the other examples given are concerned with the clarification of the problem at this immediate moment. However, it cannot be supposed or claimed that an article of limited length would in any way exhaust the possibilities of this discussion. Experimentation will have to be diversified in order to lead to reliable conclusions.

Taxpayers, on whom public school systems depend, have in most cases shown great reluctance to vote for improvements much exceeding what these systems had to offer when the voters themselves were of school age. Even capable local Boards of Education find themselves frequently embarrassed by this reluctance of voters to endorse necessary bond issues, and it becomes evident that a few speeches and newspaper articles just before bond elections do not suffice to explain to a hard-laboring generation the significant implication of a truly modern school building program.

The least valuable aspect, the massive monumentality of some senior high schools, supposedly an ornament to the community, has in the past often been used to interest chambers of commerce and patriotic voters at large. But this means misleading patriotism and civic interest in educational matters. Too much valuable money has been wasted on external cathedral and palatial architecture, and too seldom has the educator himself been employed by the public relations department of the average school board to arouse the people's interest in his problems.

In several foreign cities, such as Zurich, Switzerland, highly attractive pamphlets have been published and, at small cost, widely distributed, showing picturesquely and graphically the obsolescence of the older school plants and the convincing advantages of the new type, layout and equipment. Popular writers, advised by experts, spread easily comprehensible messages of what this rejuvenation of the plain but educationally practical plants will mean to the population. The subject grew to be an issue of lively public controversy and it became apparent that — no matter whether the chicken or the egg comes first — adult education must in a way precede child education.

With the confidence of the public gained and its interest aroused in a reform of school planning the Board of Education will find that, as the next move, experimentation on a restricted scale is necessary before radical changes are made on a broader front. In Los Angeles, for example, this has been done recently and each member of the board, the officials of the superintendent's and school architect's offices were kind enough to give the writer valuable coop-



Aerial view of final development proposed for the Lawton Avenue site with four classroom wings after study had shown that it was possible to add another wing without unduly crowding. 1. Administration wing at Thirty-first Avenue upper level entrance. 2. Auditorium and P.T.A. room. 3. Kindergarten with play patio. 4. Classroom wings with classroom patios. 5. Thirtieth Avenue entrance on lower level. 6. Play yard with physical training apparatus. These numbers apply also to the other aerial view.

eration in the promotion of an experimental school construction. The illustrations (see pages 81-85) and the estimates of six new structural systems for the activity classroom represent portions of a research project, for which the board of the Los Angeles school district commissioned me. In this connection they appear suitable to show the novel economics and technology of elementary school work.

As shortage of funds is a rather general ailment, certain economies may influence the decision in favor of the one-story layout for the activity school.

If the old-time fixed seating arrangement of the classroom gives way to movable chairs and tables, the live load on floors must be figured about 75 per cent higher; this speaks against multi-story designs and puts a premium on waterproofed and insulated floors on the ground. Stairhalls and stairways consume costly floor area and call for higher fire resistance of construction and enclosure, as does the tall structure itself. The building laws justly relieve the one-story schoolhouse of quite a few expensive fire protective measures. Building codes on the West Coast prescribe that material storage compartments, so necessary for activity training, should be situated on the ground only. Fire exits on the yard level are extremely simplified. Dimensioning of the structure for considerable lateral loads from wind attack and earth shock can be dispensed with. Ground floor toilet groups are better accessible while stacks are reduced in height. Sound insulation between floors becomes unnecessary.

The ratio of instructional area to total area is most favorable in the illustrated example of a one-story structure. Spain-Moehlman-Frostic (*Public Elementary School Plant*, p. 107) say: "Ideally, the most perfect type of building from the standpoint of instruction and safety would be a one-story structure."

But there are also objections against it. The horizontally extending layout undoubtedly prolongs walking distances, particularly if one-sided classroom wings are used for proper orientation and illumination. The Ring-Plan-School design attempts to shorten these distances to the possible minimum.

Moreover, pedometer tests made on children in Detroit show that during school hours, including gymnasium and play periods, they travel one-half to three-quarters of a mile per day — this in schools of the extensive "spreading type." In the traditional type of school the daily rate is one-quarter to one-half a mile. Out of school these same children were found to travel in their spontaneous activities one to ten miles per day! It is therefore biologically "against the grain" to confine children to such limited possibilities of motion, as even granted within the most extensive school plant.

Another more serious objection against the horizontal school, as we may call it, is the question of heating which with its installation frequently burdens the building cost with 25 per cent of its total. Doubtless a structure of cubical shape will show comparatively a minimum of heat losses during the fifteen minutes while one air volume is being exchanged for another. But biologists convince us that the most natural and healthy reception of warmth by an organic being is not through contact with warm air: radiative transmission is more natural and wholesome.

Technicians find that using an air volume as heat storage is efficient only if one does not insist on its frequent exchange by reason of chemical pollution of this air volume. They also know that only very subtle contraptions will succeed in keeping humidity contents adjusted to air temperatures. Most afflictions of the respiratory organs occur when persons undergo the violent change from room to outdoor climate where air temperature and humidity content are so different. Interested for a long time in these facts favorable to radiating heat I have with Mr. Duiker inspected his open air school in Amsterdam, where low temperature ceiling panels furnish all radiation necessary, even when all leeside windows are open.

I have installed in one case a ground floor construction in a steel structure, with the purpose of making the entire floor area a tepid and radiating panel of diatom cement composition, effective even if the steel and glass sliding doors are opened opposite to the side of wind attack. A 6-inch deep plenum chamber spreading under the entire floor area is by slow electrically boosted convection provided with hot air. Heat losses into the calorific ground are practically negligible.

This really ancient hypocaust heating system favors the ground floor school plant and makes the liberal opening of the activity classroom into its attached outdoor classroom feasible. The perspiration of glass areas in winter time can be largely stopped because the humidity content of the low temperature air also can be kept low. In such a set-up warmed air is only a minor by-product and heat losses through unhermetical joints and by conductivity of enclosures are of greatly reduced significance. Whatever the present difficulties may be in matters of school room climate, it can be safely expected that progressive technology will tend, even under habitually severe weather conditions, at least to approximate those advantages, which milder climates yield without engineering efforts. Strictly confined "intra mural" education will be minimized.

Also in school buildings, modern architecture is a return to nature — that is, to biologically suitable circumstances. A return by technical, rather than by romantic means.

Example: The proposed school plan assumes as a concrete basis the plot of the Lawton Avenue Elementary School, San Francisco. This site, only about two acres, but extensible northward, was selected for experimentation because it necessitates the overcoming of certain difficulties and limitations of the ground. Not permitting a typical treatment, in general, it illustrates the adjustment problem, where typical and typically oriented classroom wings are placed on a plot of peculiar properties. The rectangular grounds are level but surrounded by streets of which two rise gradually on fill, so that the southwest corner of the property is elevated more than two stories above this general level. Thirty-first Avenue on the west and Thirtieth Avenue on the east thus require access to the plot on two different levels.

The plan connects these two accesses with a wide covered walk and a walking deck on the upper floor. The lower walk serves as a concourse for the open air corridors of the three east-westerly oriented one-story classroom wings to the south, and the physical training grounds extending north. Washrooms and play yard office open on this concourse. The upper walk, which offers a full view of the activities in the fifteen classroom patios, terminates directly at the principal's office and the Thirty-first Avenue entrance. From here, an incline leads down to the well-separated kindergarten with its southerly play yard, fully protected against the prevailing stiff west breeze which,

coming from the ocean, is stopped by the elevation of Thirty-first Avenue. The two-story administration building contains a front office with waiting room and extensive office storage, the principal's office, teachers' rest and dining rooms (with a small kitchen), the medico-dental examination room with an educational hygiene exhibition in its anteroom, and toilets. It connects with the auditorium which a collapsible partition will — for certain purposes — divide into halves.

The lower story has its own and nearly level entrance from descending Thirty-first Avenue. It contains the P.T.A. room, near this front entrance, and the library and special opportunity room in close connection with the rest of the instructional areas east of the Administration Building. On a total ground area of 94,100 sq. ft. the area occupied by structures is 34,200 sq. ft. Corridors and stairways in classroom wings are eliminated. Great emphasis is laid upon the intimate relation of interior and exterior spaces.

Each interior classroom is practically duplicated in floor area by an outdoor classroom, into which it opens by means of a wide glass door sliding under a roof overhang. Each classroom is further equipped with a two-compartment work and storage space easily supervised by the teacher, where the materials are handled which play such a significant role in the activity curriculum. There is light influx provided from the east and west in a manner that makes the grouping of children independent of the usual one-sided fenestration, and does away with the necessity for fixed seating arrangement which, though possibly suitable for the old-type listening school, interferes with any satisfactory unit-of-experience training.

Under this modern method actual small buildings are being put up, furnished and used by the children in their study. Academic subjects are taught in close relation to the structural projects of the pupils, often extending the activity outdoors. The provision of a patio for such work unburdens the floor area of the interior room.

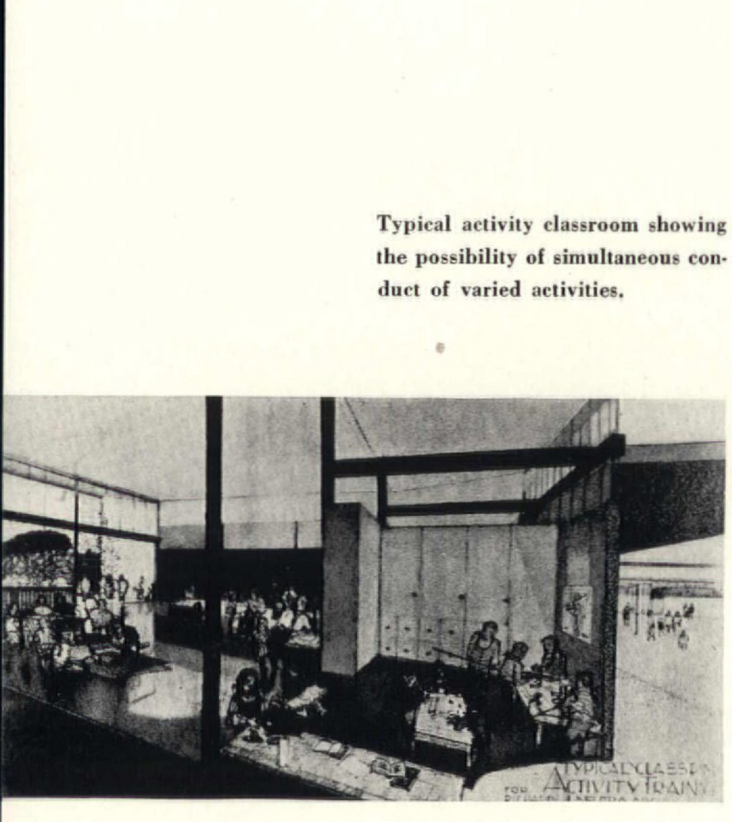
Roof projections over windows supplemented by short vertical roll-down awnings, largely exclude bothersome sun radiation while admitting ample diffused light, well distributed over the area of the room. Individual window shades become unnecessary. Fire risk for the children is practically nil on account of free exits to the outside grounds. Earthquake risks and danger from violent air motion are minimized by the one-story character of the classroom wings without any heavy superstructure, bulky roof, or attached dead loads.

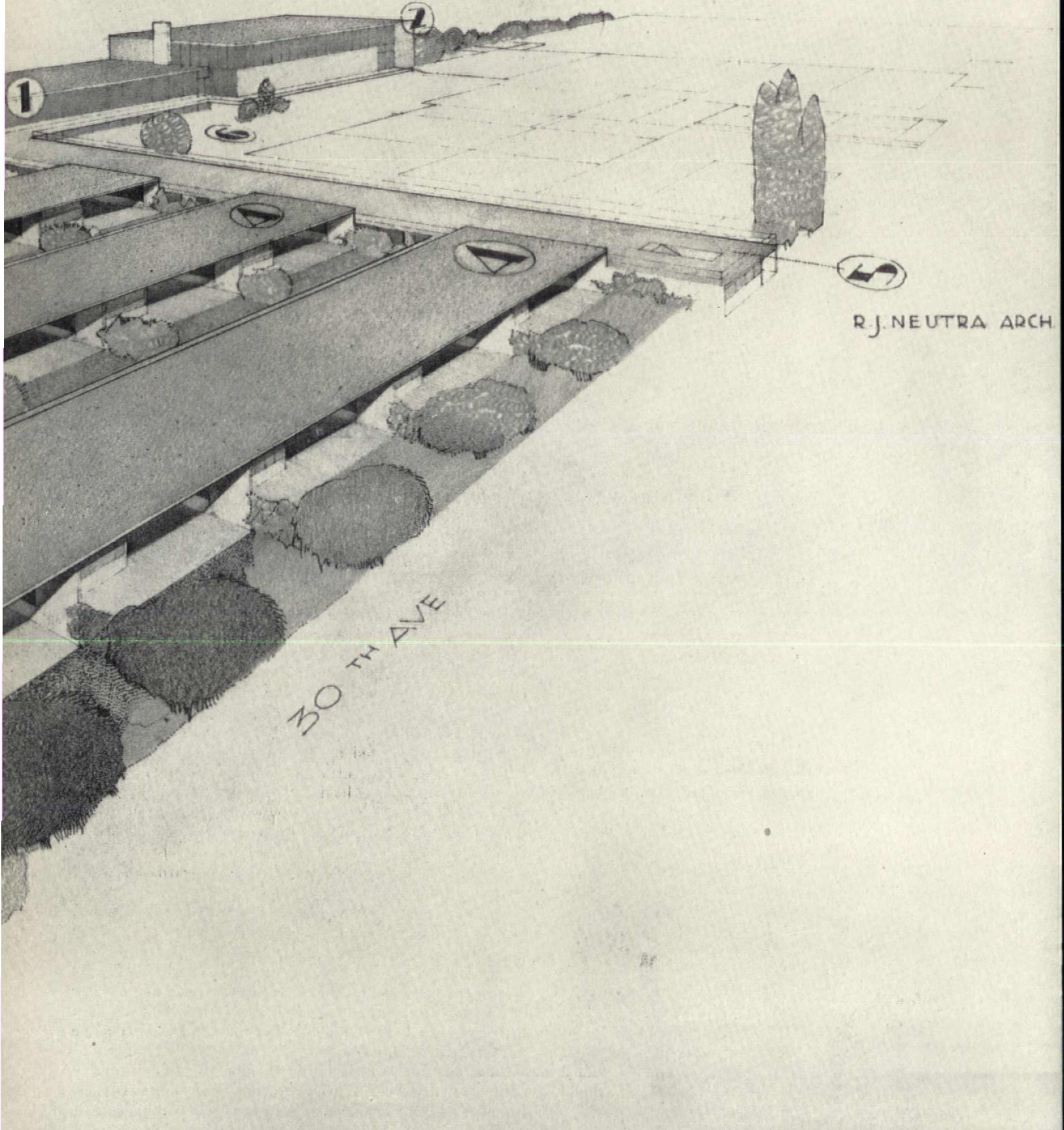
These rooms abut on covered walks which replace the usual corridors. The covered concourse is a roofed extension of the play court to be used for exercise in rainy weather, with the various gymnastic apparatus and play equipment for primary and upper grades placed in the open area in front of it. The kindergarten, as mentioned, has its own secondary entrance and entrance patio, near and easily inspected by the principal.

The auditorium as well as the P.T.A. room with its washrooms and street side entrance permits the use for adult activities of variegated character; the teachers' tea kitchen is so located that it may upon occasion serve parents' gatherings.

As it has become desirable to give the school library a dual function by equipping it also with books and periodicals for parent education, the library is so placed that it faces and opens both ways, toward the instructional area

Typical activity classroom showing the possibility of simultaneous conduct of varied activities.





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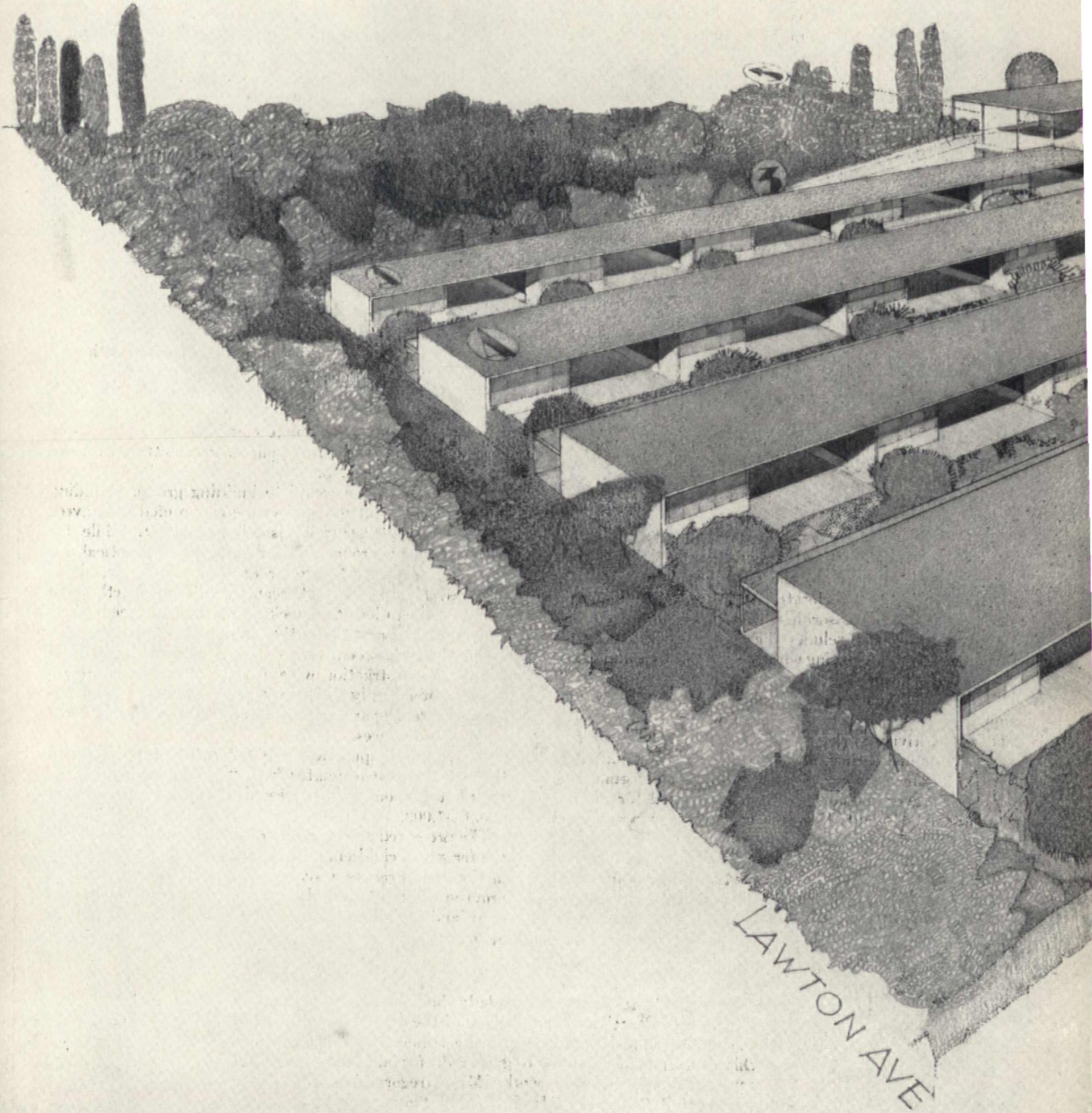


AERIAL VIEW WHICH SHOWS THE MAXIMUM DEVELOPM

for the children and toward the Thirty-first Avenue lobby and the P.T.A. room where bulletin boards will give reading advice to adults. Work and storage facilities for administration, for kindergarten, and for classrooms of primary and upper grades have been studied in detail.

Of the four possibilities of seating: (1) fixed desk, (2) double tables, (3) single tables, (4) movable chair desks, the first was eliminated for the sake of activity study and the fourth on account of cost. The double table proved to yield about 8 per cent more of unoccupied floor area and therefore was chosen. Chairs and tables, as shown in the illustrations, can be arranged in manifold manner both indoors or outdoors or put aside altogether when free floor space is needed. Collapsible cots, in sections of 4 ft., fold down from under the chalk rail of the blackboard and serve for rest periods necessary to children of the lower grades.

Of the two work-compartments, one is devoted to activities which require water and heat. A sink, drain-board and heating plate are installed here. Metal lined bins for clay storage, metal lined shelves for clay models and drawers and shelves for pertinent tools are provided.

The other compartment is arranged around two small work benches, with lumber and hardware storage, closets for textiles, paint, cardboard and paper of large sheet sizes. There are adjustable shelves and shelves with removable cross partitions to accommodate children's half-done work. A fold-down table with adjoining lockable drawers on the classroom side serves the teacher as desk space. A children's coat closet and lunch shelf and lockable teacher's closet supplement the classroom equipment. All doors hinged or sliding are flush panel doors with tempered prestwood facing; all drawers and pull-out boards have undercut grips to minimize hardware, and metal extension slides to utilize their full depth.

Two upturned reflector troughs with daylight bulbs placed at transom height along the two long classroom walls throw their light to the reflecting diffusing ceiling which is faced with perforated enamel sheet steel over a prefabricated sound-absorbing composition sheathing. The electric equipment includes Telechron clocks, call and return call bells connecting with the principal's annunciator panel and fire alarm signal.

The floor is covered with asphaltic Mastipave or resinous Floorhide, as a good deal of water is occasionally spilled in activity work.

As mentioned earlier, according to recommendations of the State Department of Education of California, five acres, wherever possible, should be allotted for an elementary school plant. However, even on an area restricted to two or three acres, as appears from the present project, it is possible to accommodate the following units:

Fifteen classrooms with attached workrooms for unit-of-experience training, 1,050 sq. ft. each, with an aggregate of 15,750 sq. ft., or about 25 per cent more than customary.

Two unit kindergarten with ample storage space: 2,750 sq. ft.

One opportunity room with secondary room for instruction materials: 1,400 sq. ft.

Fifteen outdoor classrooms, each 750 sq. ft., as addition to the net classroom area: 11,250 sq. ft.

A fully equipped administration wing with lunch- and rest-rooms for teachers and rooms for medical care. Total of 3,450 sq. ft.

Two large rooms separated by folding doors which may be thrown open to form an assembly room with stage and dressing rooms: 4,870 sq. ft.

P.T.A. room adjoining the auditorium, 1,950 sq. ft.

Play yard office, pupils' toilet groups, janitors' rooms, etc.: 4,200 sq. ft.

An aggregate of play yard partly roofed: 38,050 sq. ft. containing the following play spaces for primary and upper grades; and on a separate area for kindergarten children:

3 triple swings	1 balancing board
1 traveling rings	1 climbing tree
1 may pole	2 basket ball courts
1 tether ball	1 tennis court
1 horizontal ladder	1 volley ball court
1 high jump	1 hand ball court
1 broad jump	1 baseball diamond with back stop
3 sand boxes	
1 slide	

The cubage of the complete classroom, including two-thirds of the outside porch spaces, as mentioned above, amounts to 17,530 cu. ft.

The cubage of the complete building group, including two-thirds of all outside spaces which are roofed and paved, but have no exterior walls, is 501,494 cu. ft. While for the sake of appearance and for purposes of practical use the enumerated parts are grouped continuously, it is proposed to introduce at regular intervals earthquake safety joints to localize shock effects and intercept their horizontal transmission by the building itself.

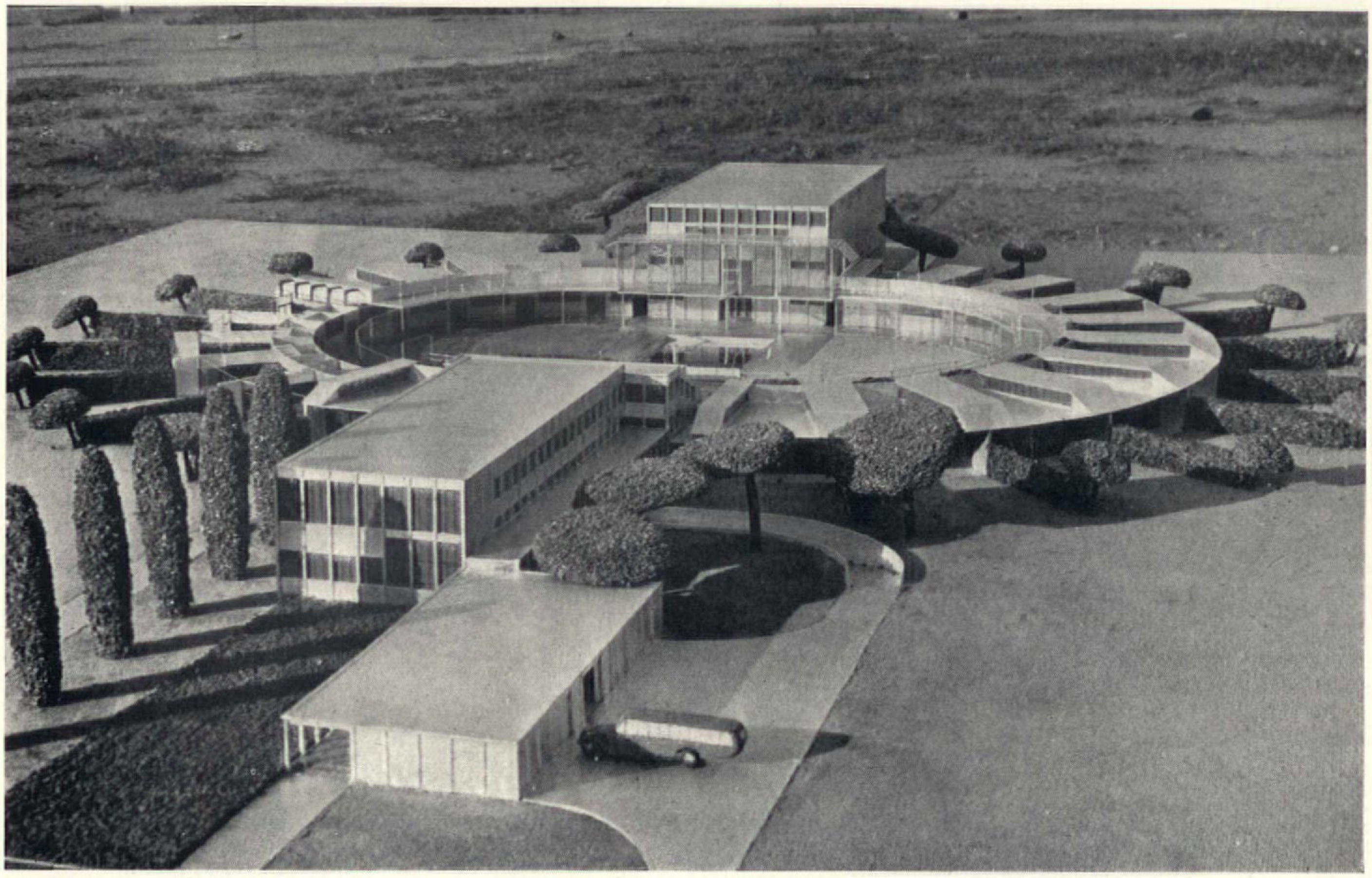
One-story classroom wings of the described layout and a skeleton construction with a cover of one-hour fire resistance would fully satisfy the requirements of the California State Department of Public Works and of local building ordinances.

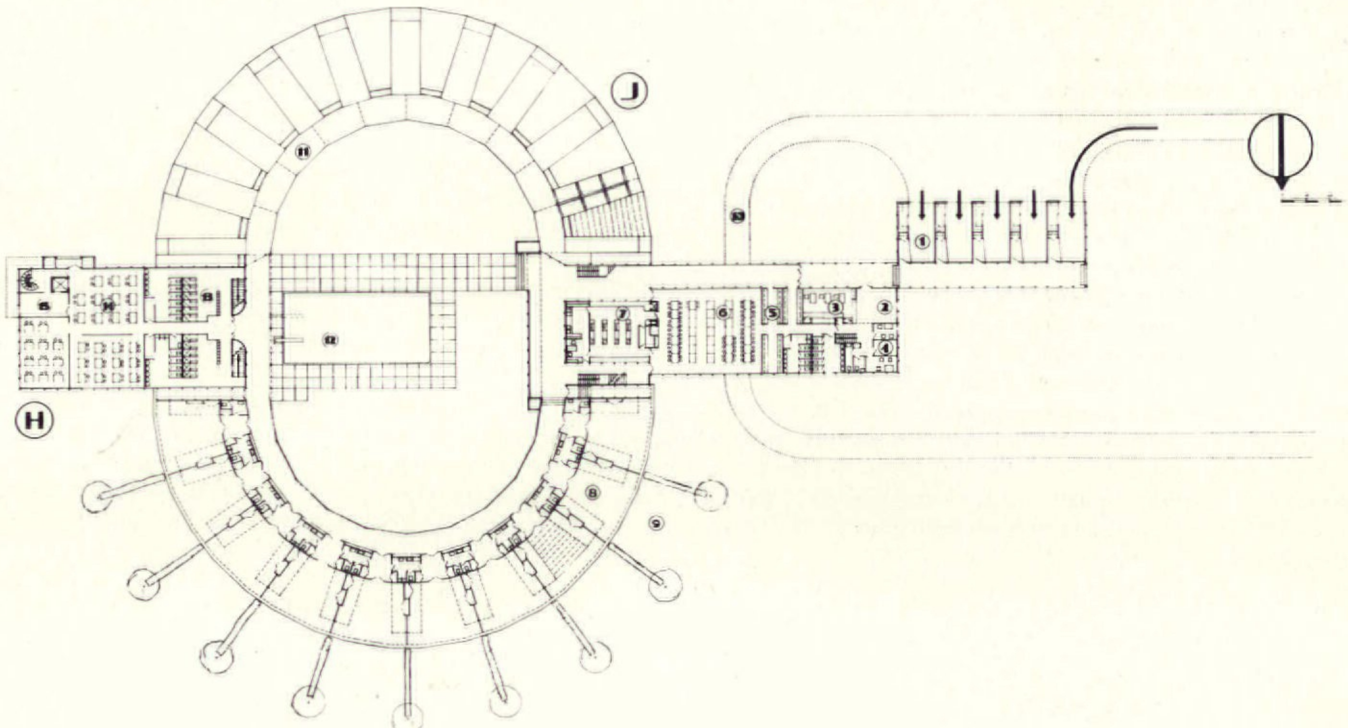
Basing the computation on a unit rate as resulting from the attached cost estimates for a very similar layout, the typical classroom unit as described can be estimated at about $5,000.

The presented project does not include lunchroom facilities for school children, as such facilities are not customary in the San Francisco school district. However, such a provision is most desirable in order to keep classrooms clean and is frequently part of the building program in other cities.

The author wishes to acknowledge gratefully the encouraging cooperation given to him in his research by the members of the Los Angeles Board of Education, by the Superintendent's and the School Board's Architects Office of this city. He further desires to give credit for faithful collaboration to the men associated with his work: Mr. Gregory Ain, Mr. Peter Pfistere, Mr. Otto Winkler and Mr. Howard G. Smits.

NEUTRA'S PROPOSED RING PLAN SCHOOL





RING PLAN SCHOOL by Richard J. Neutra. This school is intended to be built largely of prefabricated sections and to serve, by bus lines, a widely distributed population.

Drawing by Marian Greene Barney

W. Pope Barney, Architect
Roy W. Banwell, Associate

SUBURBAN ELEMENTARY SCHOOL

providing a modern and efficient plant for a work-study-play program for 1,200 pupils

By

W. POPE BARNEY, A.I.A.

ROY W. BANWELL, ASSOCIATE

Size. Designed for a basic capacity of 1,200 when operating on a "work-study-play" program where a third of the students are in class, a third in special activities rooms, study and library, and a third are in play or play projects.

Classes. Classes are graded from one to eight with the kindergarten and kindergarten extension added.

Classrooms. Classrooms depart from the traditional type to gain:

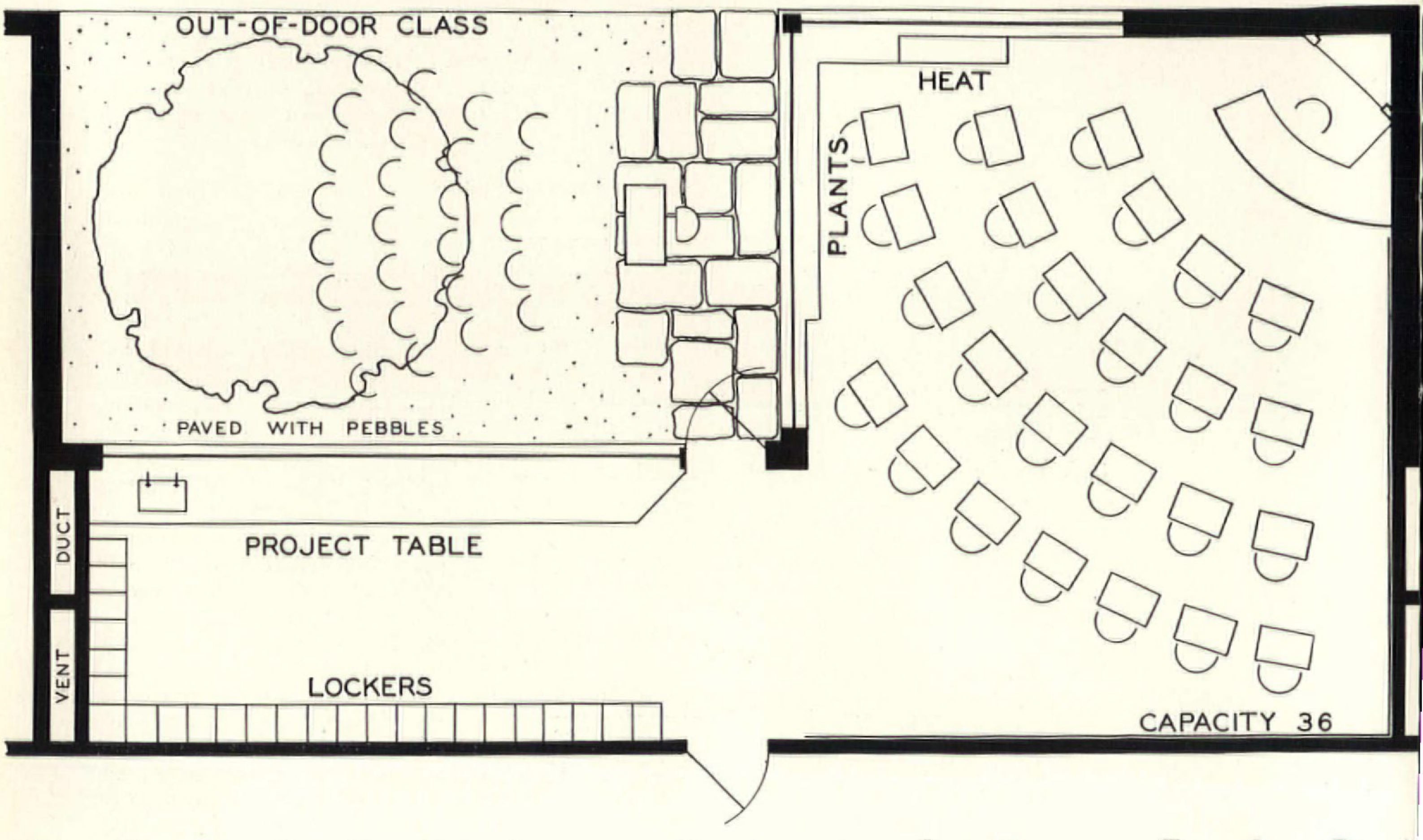
1. Greater flexibility in seating with movable desks.
2. Closer rapport between teacher and student when arranged for maximum capacity.
3. Less side glare from windows.
4. Reduction in number of students at maximum distance from windows.
5. Both southern and eastern or western light for each class.
6. Better lighting of blackboard space.
7. Greater privacy of one class from its neighbor in the matter of transmission of noise through windows or through walls.
8. Possible use of outdoor classroom space by the lower grades of segregated areas immediately adjacent to their indoor classrooms.
9. Makes one teacher supervision of both indoor and outdoor class possible.
10. An area per pupil of 15 sq. ft. as against 16-17 sq. ft. per pupil of the normal classroom if used for maximum seating.

Auxiliary Rooms. Adjacent to each classroom is a perfectly lighted space 10 x 26 ft., developed as special projects' work space, locker space, vestibule, and in the case of the younger children, toilets, exclusively for the use of the adjacent classroom. This shallow room makes possible good borrowed light for corridors.

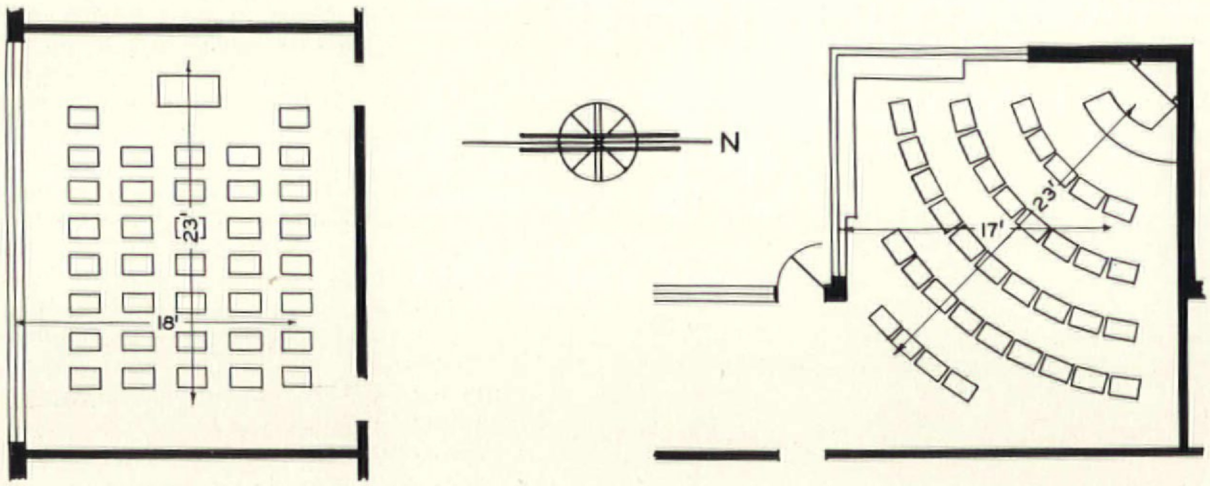
Corridors. Arranged for extreme simplicity with use made of both sides.

Gymnasiums. The gymnasium for boys and the gymnasium for girls are lighted entirely from above by north-facing, saw-tooth sky lights supported on Bethlehem Steel sections. The galleries overlooking the gymnasiums form the means of communication between the main corridor and the auditorium unit.

Auditorium. So placed that it can be used by the public without inconvenience to the school. Designed to seat one-third of the student enrollment with a well-lighted stage of adequate depth for the performance of amateur theatricals participated in by the school and/or the community. The natural light on the stage makes possible its use as a work shop in the building of scenery, etc. The cyclorama is designed as a series of folding screens, the front surface of each section of which is concave and the rear surface flat, thus making possible its use not only as a cyclorama but in various box stage and wing formations, having great flexibility and artistic possibility at a minimum of cost. The auditorium is the same size as the gymnasiums, thus standardizing the construction unit. The floor level is



T Y P I C A L C L A S S R O O M



COMPARISON OF CLASS ROOMS FOR MAXIMUM SEATING

USUAL TYPE
22' X 28'

PROPOSED TYPE
21'-6" X 26'

5 ft. above the adjacent earth terraces which are in turn 3 ft. above the street level. This puts the stage at the same level as the galleries overlooking the gymnasiums and gives light to a basement developed under the entire auditorium group for the usual heating service, public toilets, possible cafeterias, etc.

Kindergarten. This is on the first or ground floor, semicircular in form, facing directly to the south and being in close rapport with the playground for the younger children. The glass goes completely to the floor and large sections are pivoted, so as to give a maximum of air when outside weather permits.

Nature Study and Rest Room. Above the kindergarten is a nature study and rest room with double glass walls subdivided into compartments giving the possibility of plant life of different climatic zones. These surround a large classroom space which will be used alternately by nature study groups and rest hour groups, the latter having the visual benefit of the surrounding green houses.

Library. At the other end of the corridor with eastern, western and northern exposure, thus getting an ideal light for reading but with sunlit corners where plants may be banked for the general cheer of the room.

Playrooms. To amplify the indoor play space and to provide for the special needs of the youngest children, two playrooms with southern and eastern light are provided on the ground floor with their own exits to the garden playgrounds, which has as the center on one side a wading pool and on the other a model yacht basin. These garden play yards become the outdoor entresols to the entire development and are designed to combine the practical requirements of play space with the added graces of architecture, sculpture and landscaping. The indoor play area when occupied by pupils allows 35 sq. ft. to each, which is a desirable excess over the usual ratio.

Toilets, Lockers and Dressing Rooms for the general use of older students and for special use in connection with the gymnasiums are placed immediately adjacent thereto. Similar facilities, but without the accommodations for showers and dressing, are available on the second floor.

Special Activities Rooms. On both floors and comprising study, science, crafts, sewing, cooking, drawing and wood shop, all placed to get individually excellent light and noise isolation.

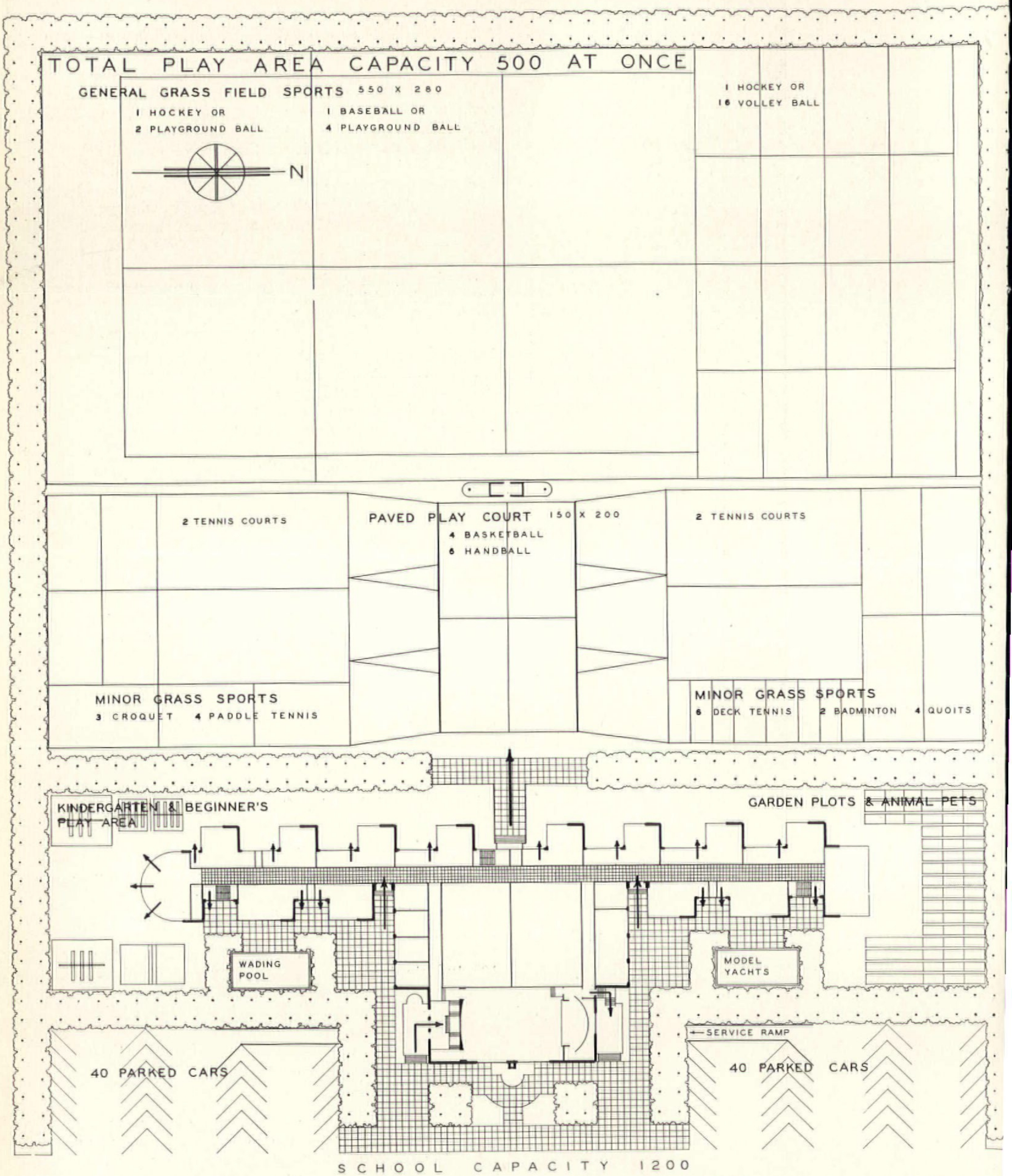
Teachers, Medical Room and Administration. Rest and lunch rooms for teachers, having southern light and a location immediately at the top of the main stair approach leading to the auditorium are off the gallery overlooking the girls' gymnasium.

Playgrounds. Playgrounds for the accommodation of 500 students at once are arranged in five main divisions.

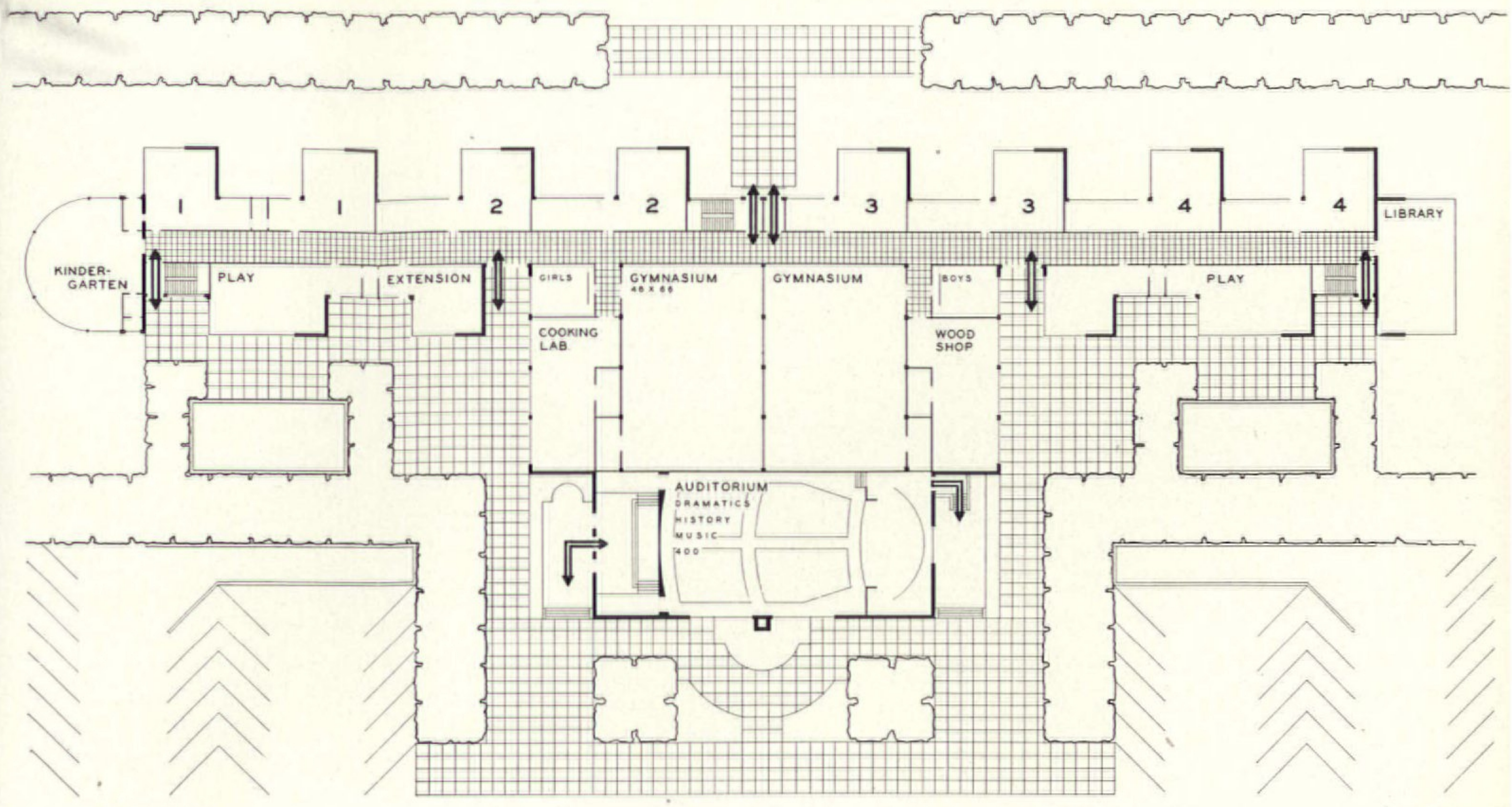
1. Kindergarten and younger children to the south, equipped with see-saws, swings, sand-boxes, slides, ladders, large scale building blocks, etc.

2. Garden plots and houses and runs for domestic animals and pets at the northern end, sheltered from the north wind by close planting and clear of the shadow cast by the house itself.

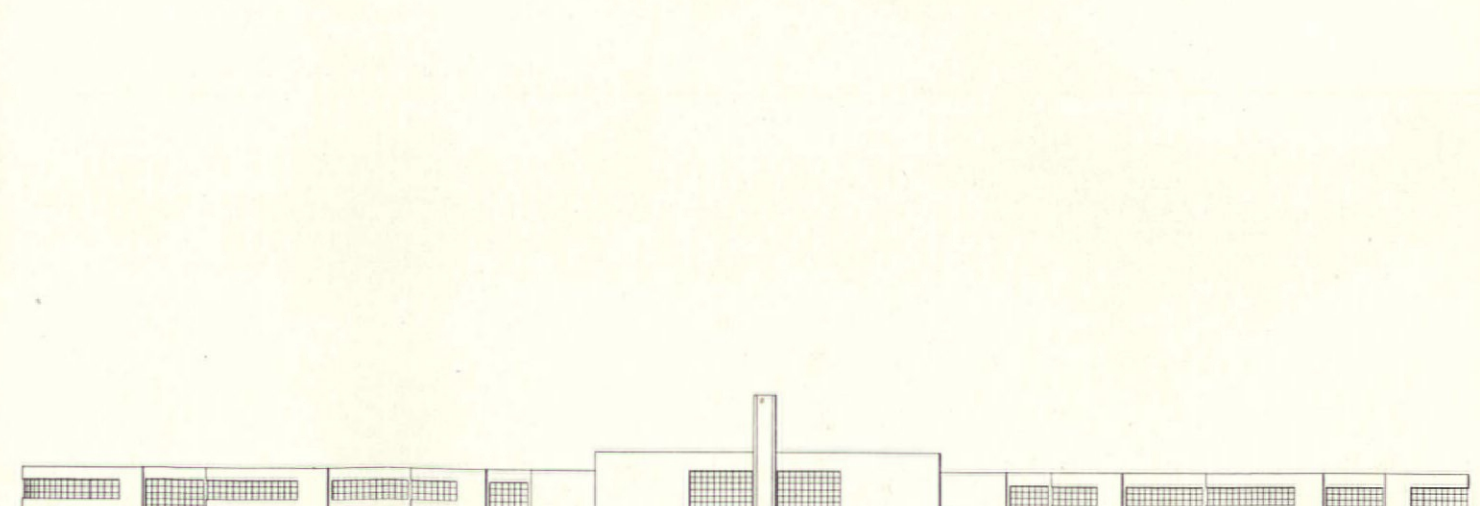
3. A paved court for winter play, basket ball, hand ball, marbles, tops, etc., is immediately on axis with the double exit from the first floor hall and second floor stair. The center area of this paved court is flanked by walls 16 ft. high forming wind-breaks for blustery weather and with smooth surfaces providing ideal playing wall for various games.



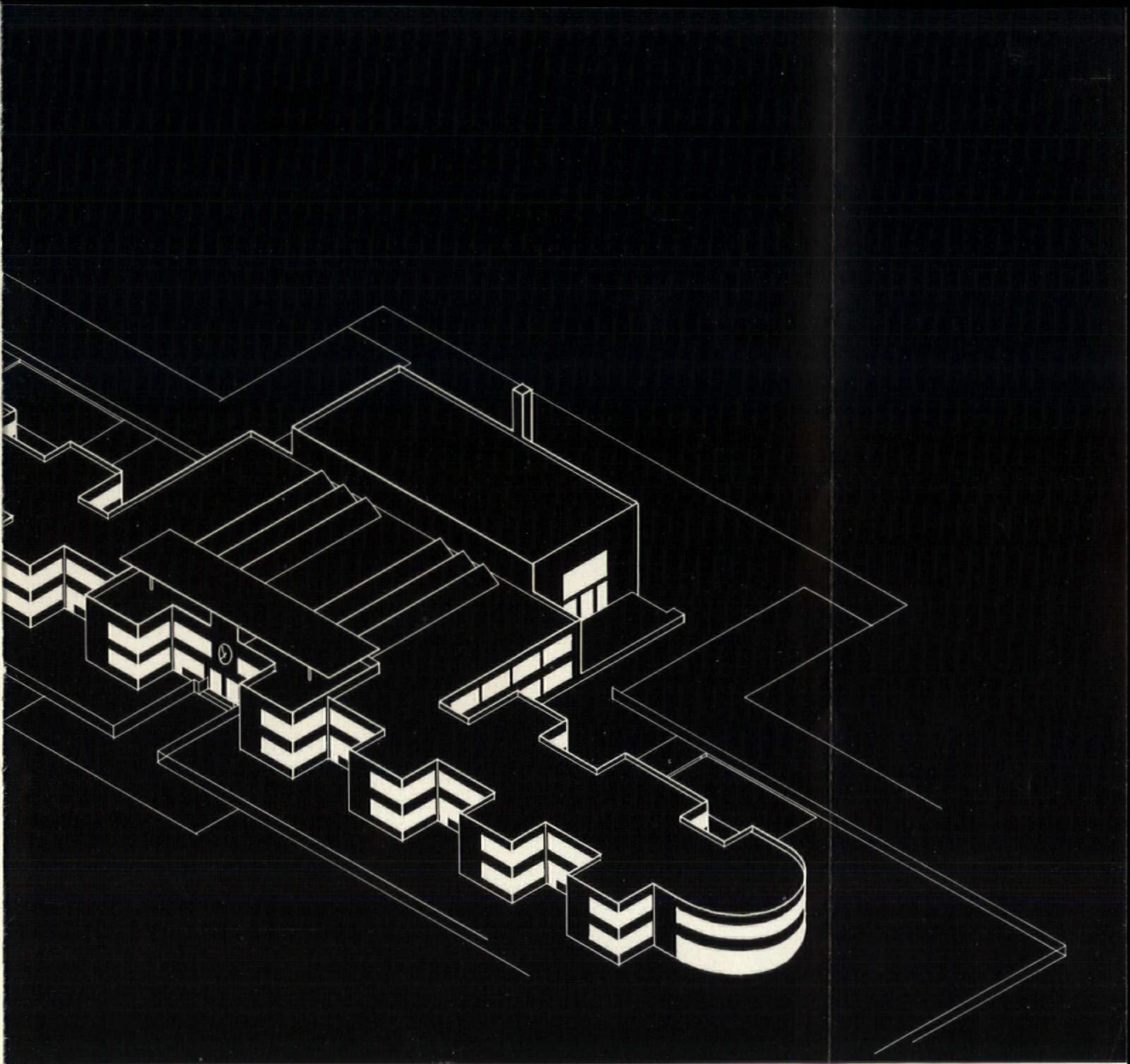
SCHOOL PROPERTY APPROXIMATELY 9 ACRE



F I R S T   F L O O R



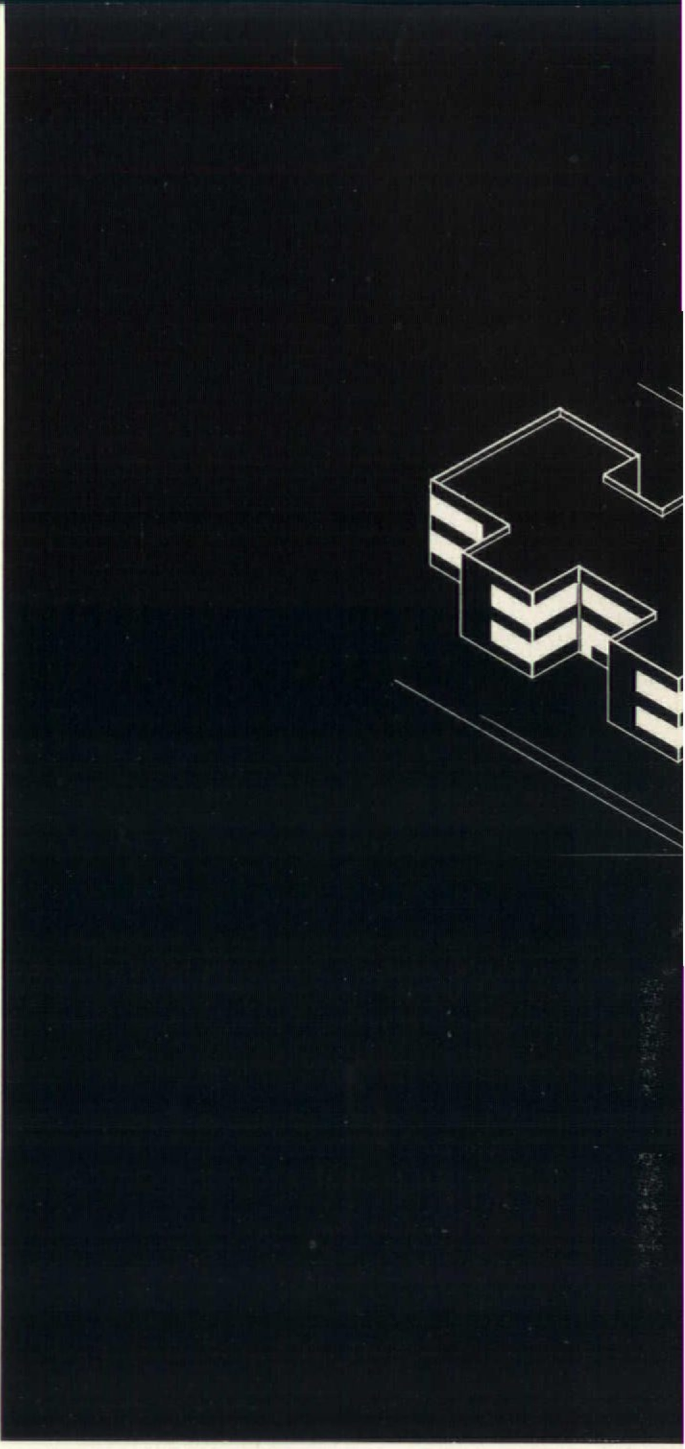
S T R E E T   E L E V A T I O N



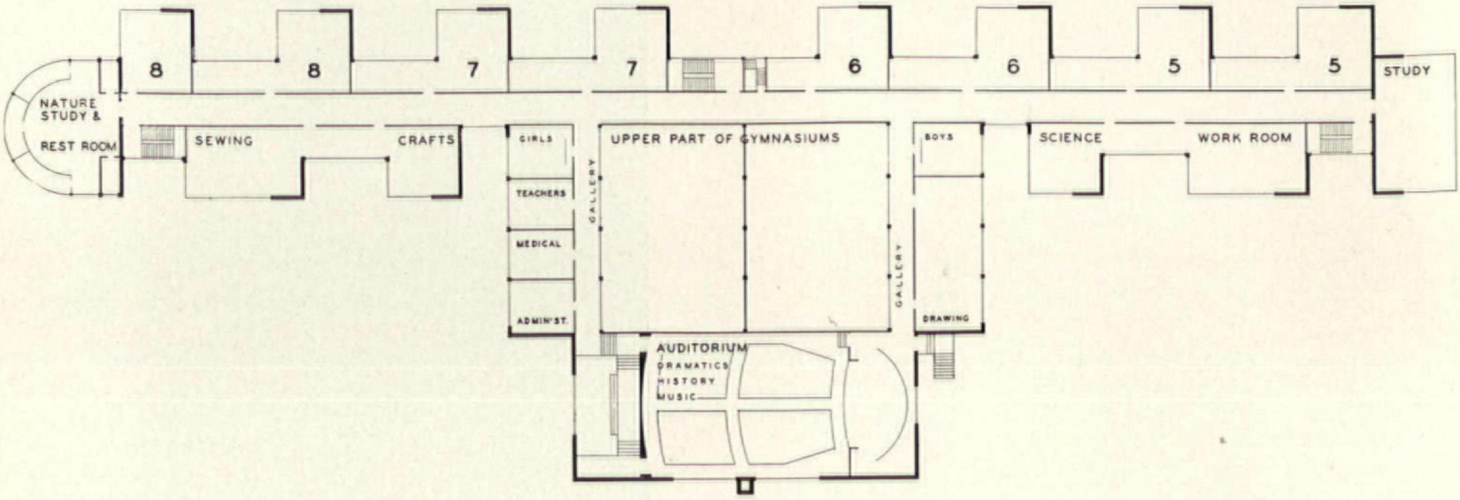
SUBURBAN ELEMENTARY SCHOOL

W. POPE BARNEY, ARCHITECT

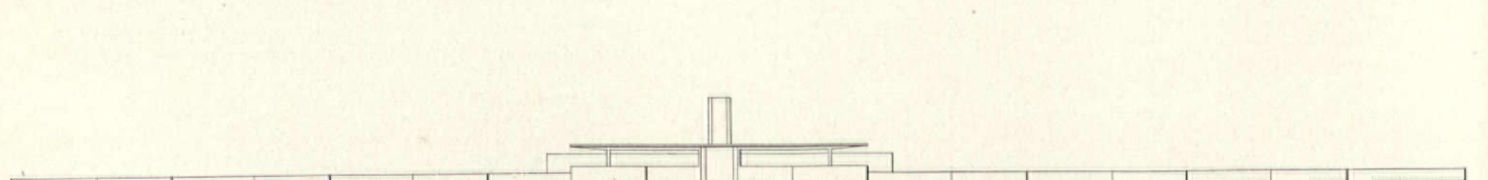
ROY W. BANWELL, ASSOCIATE



"The simplest and most direct answering of the requirements of lighting and sound construction. The beauty sought is a quiet orderliness enlivened by landscaping and the introduction of significant sculpture at the points of exit and entrance on the exterior and by free use of color on the interior." Barney



SECOND FLOOR



PLAYFIELD ELEVATION

4. Surrounding this play court on three sides with access from the path under a double avenue of trees is a turf area for minor field sports, badminton, deck tennis, quoits, archery, etc.

5. Out beyond is the big play field with sufficient space for a full junior league baseball field and two hockey fields.

Planting. Entire development is surrounded by formal planting which is considered an indispensable part of school environment, giving the touch of color, beauty and civilized atmosphere which is conspicuous by its absence in most school plans.

Approaches. It has been recognized that the approach and parking of cars and trucks presents a problem involving both physical hazard and disorderly appearance. Islands of parking surrounded on three sides by ample sidewalks make safe the incoming and outgoing of both cars and children. The main road approach is of course on the school's own property but no excess land need in this scheme be devoted to unused and unusable lawn areas. The rooms needing quiet face the play fields and are sufficiently separated from them by planting to render their noises inconsequential.

Architectural Expression. The simplest and most direct answering of the requirements of lighting and sound construction. The beauty sought is a quiet orderliness enlivened by landscaping and the introduction of significant sculpture at the points of exit and entrance on the exterior and by the free use of color on the interior.

Mechanical Plant. The mechanical plant is in the basement, 7 ft. of which is above ground and is located beneath the auditorium block. It is approached by a service drive which goes down a ramp in the parking area, thus making the delivery of supplies and removal of waste entirely safe and inconspicuous.

Ventilation. Ventilating units under the eastern or western windows of classrooms and at the ceilings in gymnasiums and auditorium provide a thermostatically controlled input of warmed, fresh air. These together with the exhaust duct from each room form an easily maintained and efficient ventilating system. Water in copper pans filled with pebbles and flower pots on the sills of the southern facing windows maintain ideal humidity. All windows except those of the playrooms, kindergarten and nature study room, are fixed sash, glazed with the newly developed thermo plate glass (a double glass with air space between). Such an installation makes possible the maintenance of an even temperature twenty-four hours in the day with less fuel consumption than the normal school uses for seven hours capacity operation and seventeen hours partial operation. This twenty-four hour controlled atmospheric condition will be found to add greatly to the maximum service to the community which this type of school is designed to give.

LETTERS ABOUT A MODERN SCHOOL

DEDICATED TO A GREAT EDUCATOR WM. B. CURRY: BY WILLIAM LESCAZE

October 8, 1934

My dear Mr. Lescaze,

I hope you will not mind my writing to you. As you know, I am still a student but I hope to obtain my degree at the end of the year. I need your advice. A friend of father's who has always slightly criticized father for sending me to the architectural school said to him the other day — "Well, if your son Philip is such a good designer, why don't you suggest to him that he make some drawings for our new Junior School?" And that is what started it all. I feel I must do something but, unfortunately, I know little about this problem. All I have been able to discover so far is that the School Board is really planning such a school. The size is given as four stories, 78 units. The accommodations are to be for 2,910 pupils and to comprise an auditorium, two gymnasiums, kindergarten, 22 special rooms and 46 general classrooms.

Can you help me? How am I to tackle this problem? What are "units?"

Yours gratefully,

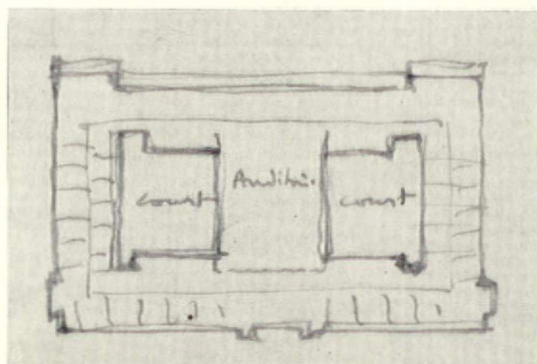
PHILIP CONNICK

October 11, 1934

My dear Philip,

All right, I will help you. But that does not let you out. You will have to work too. You cannot start to design a Junior High School nor anything else for that matter on any information as vague and incomplete as this. You can't do it. I can't do it. That is, if you mean to get a real solution and do a little bit of real architecture. If all you are aiming at is to make T or L or U shaped plans, or something like this (Sketch 1), if your ambition is to put sunk or raised panels between the windows, a base molding and a cornice around the building, then a tower somewhere something like that (Sketch 2), then you might as well enter your father's paper business right now. But since, of course, Philip, I know how serious you really are about this architecture which matters so much to me, I shall help you as seriously as I can. Tell me, you do know, don't you, that you can't possibly start without a lot more information than your letter of October 8 contained? You have to have —

1. The size of the plot.
2. A contour line survey to show if the plot is flat or sloping and, if sloping, which way and how much?
3. The points of compass. I like the sun, and the children and teachers will like it too.
4. The location, height, bulk, characteristics of adjoining buildings, if there are any.
5. Location of other schools nearby. Maybe, that plot is no good for a Junior School.



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2

6. Characteristics of population, race, occupation, number and age range of children.

7. Transportation facilities — street car or subway nearby? Or bus service? Less traffic on streets than on avenue?

You have to do more, much more, than just a set of drawings. That Junior School of yours must make sense, must be related to the community, must be integrated. It can't be just another school building. Do you know that New York City has had 250 school projects between 1921 and 1931! Go after your School Board and get definite information. Here is what Mr. Dobbin, a superintendent of school building, says:

"No architect, however experienced, can be expected to plan an economical, suitable school for a given community until he has a definite knowledge of these local requirements and yet it seems to be the exception rather than the rule for educational authorities to furnish this information or for the architect systematically to seek it as a preliminary to the preparation of plans."

Yours sincerely,

LESCAZE

October 13, 1934

My dear Mr. Lescaze,

Armed with your letter, I have been to everyone I thought might know some of the answers. I am afraid you are going to be quite disappointed with the meager results of my efforts. Nobody seems to know anything very definite. Why is it? I don't understand. However, here you are:

1. No dimensions, plot between two streets and along an avenue.

2. No contour lines survey available. Might have one in the Department of Highways. I shall go tomorrow.

3. As the avenues run in south-south-west — north-north-east direction, that establishes the compass more or less.

4. How can I get this before I know the location? Same answer, alas, for your other questions.

I am quite distressed.

Sincerely yours,

PHILIP CONNICK

October 14, 1934

Dear Philip,

All right. It's just what I expected. You — with a thousand others — think that good, real architecture — architecture which makes sense — can be built on such feeble information. What on earth are you learning in your school? To figure out the shadows cast by a colonnade! I am telling you there won't be any real architecture until there is a definite, clear-cut program. A long time ago when I was a beginner and trying to make someone understand about modern architecture, I lived in another city. From time to time my spirits would get particularly low

and I would go to a little book store where a good friend of mine who greatly loved books had decided to make other people love books and want to buy them. I would chat awhile with my friend and I would be refreshed and stimulated.

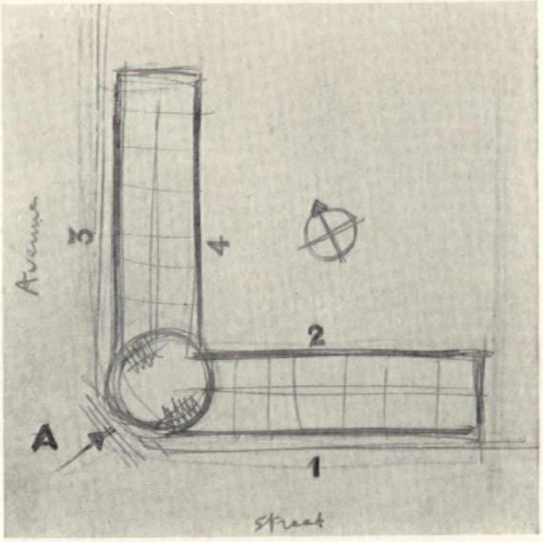
On such a visit, he suggested that I should make drawings for a few houses and he would exhibit them in his show window. I had great difficulty to make my friend realize that it just could not be done. At least, not by me. You have to know something about the people who are going to live in the house you design before you can design it with any intelligence. The more you know about them, about their habits, about the site they have bought, about how much they can safely spend on the house, the more likely is your design going to be direct, economical, beautiful. Modern architecture is, in its essence, the expression in form — the plastic expression — of a certain philosophy of life. You might fill drawers with extraordinary drawings, but they are meaningless unless they become buildings. You must find out what views your School Board has on education and on life, what qualities they intend to develop in their pupils. Do they propose to produce free creative individuals conscious of the rights of individuality and at the same time citizens capable of cooperation and filled with an adequate sense of responsibility? Work at all that, will you? It is infinitely more important than a drawing at this stage. In the meantime, here are a few Don'ts:

Don't sacrifice a real school need to an architectural formula.

Don't put the entrance and main exit in A. (Sketch 3.) That's the worst possible place. Traffic is heaviest there and it doubles the chances of accidents as the children run out of school. Don't put the wings like that. If the sides 3 and 4 are approximately good from the point of view of exposure, then 1 and 2 are decidedly bad. The same is true of Sketch 4. Only, here it's worse; 50 per cent of the classrooms are on a court. Think of the gloom and of the reverberation of noise! You may be able to have rooms on only one side of the corridor and thus for all the rooms the same exposure and the same outlook. This presents great advantages. The corridors would have abundance of daylight; the wardrobe could be in the corridors. However, it does result in a higher cube and it may be too costly. But you must find a way of making all the rooms equally good.

Don't plan any other solid masonry wall but just what the structural columns and their fireproofing require. (Sketch 5.) Choose carefully your type of windows, so that as large an area as possible can be thrown open. (Sketch 6.) This shows what we did at the Hessian Hills School not far from here. Or for a nursery room where a great deal of sun is wanted and where the ventilation is obtained by separate windows. (Sketch 7.)

Here is something else you might give some thought to at the same time that you find out your School Board's theories of education. Think of the ideal table and chair. Think of what else goes into a classroom: blackboard, closets. Then think of the ideal classroom — light, ventilation, sound. And your solution to all that will be your "unit." In New York the "unit" seems to have been standardized at 24 ft. width and 28 ft. length. That allows eight rows of five desks — 40 pupils. Personally, I think it's too many pupils. Try with nine rows of four desks — 36 pupils. The unit would then become 20 ft. wide and 32 ft. long. It



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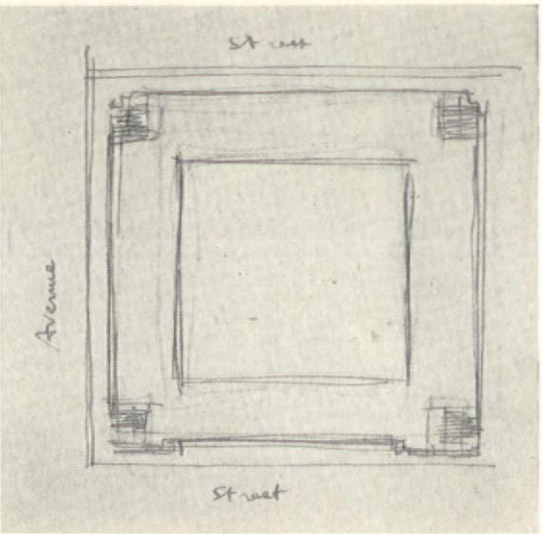

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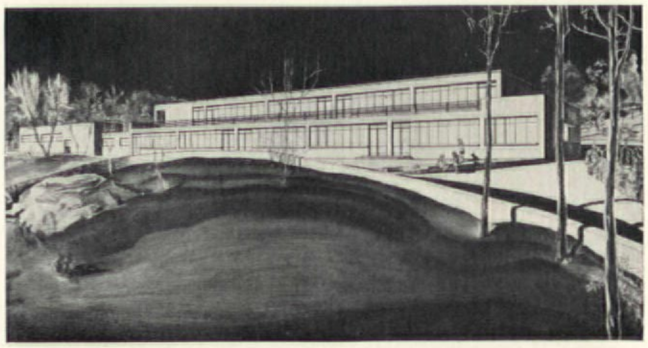

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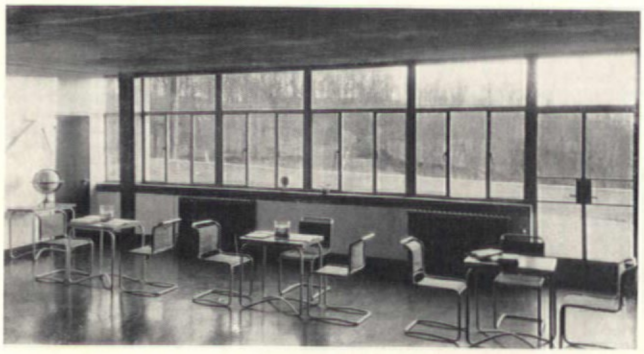

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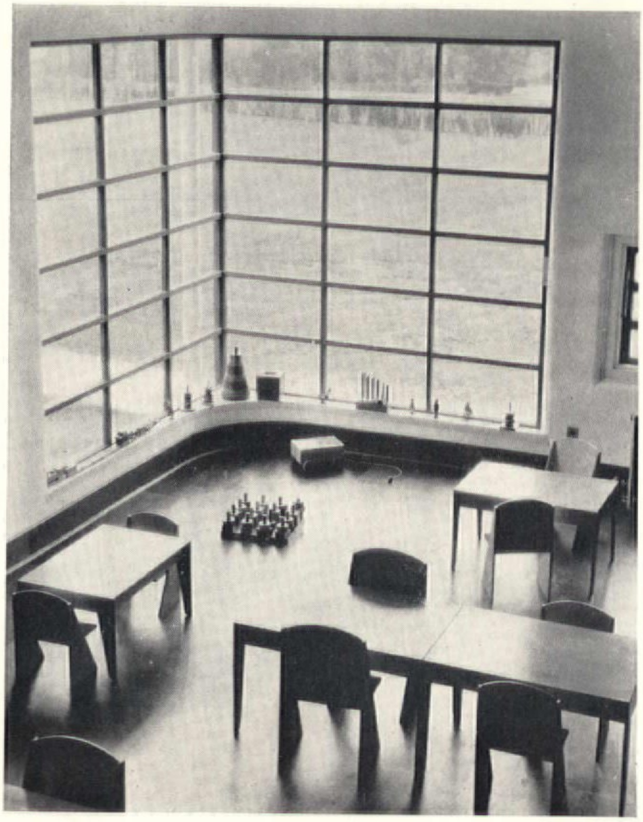

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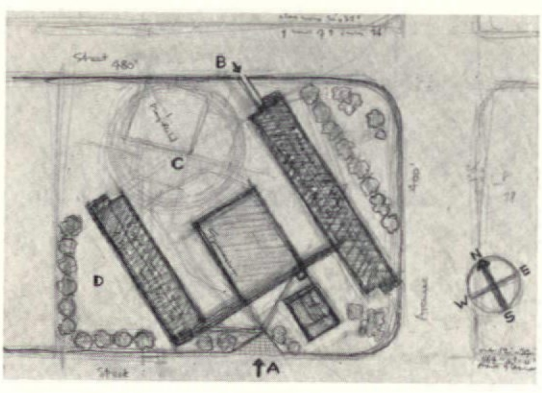

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would give much better daylight. I don't know that you could argue that the cost of the added cube would be offset by savings in the electric light bill. You might decrease the cube by reducing the clear ceiling height somewhat (I would think that 9 ft. 4 in. is ample) since you have reduced the width. At any rate, here is a rough sketch (Sketch 8) to calm your impatience, although we still don't know the size of the site.

You will see that one long building is devoted to general classrooms, these to be the new unit 20 x 32 ft., and that three stories are all that is needed to obtain 48 rooms (you wrote about 46; allow for growth). The shorter building is restricted to special rooms and two stories will give you the required 22 special rooms. There is a good reason for making these buildings distinct and separate. Teaching in a classroom is one thing. Teaching woodworking or typewriting is another thing. Your room dimensions, your light and noise problems are different. Obviously, what is right for a classroom will not be exactly as right for a special room. But if you conceive of them in two separate buildings you might well make them equally right within their characteristics and at the same time create some additional architectural interest.

By the way, you get a small playground in "D" sheltered from the play field "C." Note also the main entrance in "A" on a side street, the secondary entrance in "B" on a side street also. The offices would be in a small building by themselves. Teachers are very useful human beings, Philip, and they should have comfortable and sunny quarters. The large building near the play field is the gymnasium. Please note that the direction north-south suggested for the buildings not only gives east light to one side and west light to the other side but also, as the buildings are not parallel to the streets, they are spared a great amount of the noise of the streets and avenue.

Good luck for your research work.

Sincerely,

LESCAZE

October 16, 1934

My dear Mr. Lescaze,

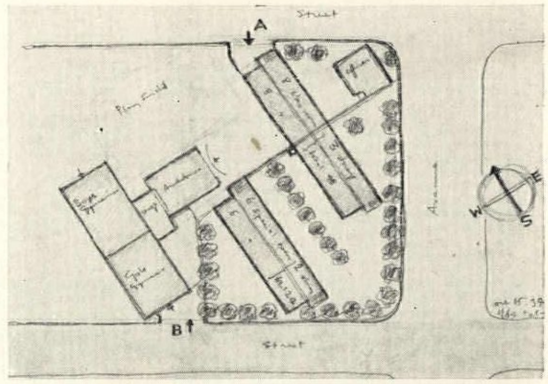
I hasten to thank you for your last letter. I had no idea that I was going to impose to such an extent on you. I went to see Mr. Castle and I made this little speech to him: "You have a certain problem here. You wish to house so many pupils, you need so much space, your methods demand a certain relation between the rooms, and science suggests that the rooms must be filled with sunlight and fresh air. We have certain materials and engineering devices which were not known when the traditional architectural forms were developed. Furthermore, if we adopted one of these traditional forms, a definite limit would be imposed upon our freedom to adapt the building as completely as possible to its proposed uses and to make the most effective use of modern knowledge. Our problem, therefore, is to use an architectural formula based on human intention, structural logic and harmonious aspect."

He said something like this: "Yes, I can imagine that a certain type of design might symbolize qualities at which any sound educational system should aim, such as truthfulness, courage, freedom, adaptability and intelligence.

I can also imagine that such a design would be a valued source of stimulation to everyone and particularly to our pupils. But where can I see such a school? What is there I can show to some of the members of my Board?" I had no answer. After a little while, I showed him your sketch and another sketch I made which follows yours (Sketch 9), but where I used the old unit 24 x 28 ft. for the rooms and added one girls' gymnasium and one auditorium, I had a little rough perspective (Sketch 10) and that seemed to interest Mr. Castle. Still, where can I tell him to go to see a modern school? Even Mr. Castle did not know the site but he promised to call me up as soon as he finds out.

Gratefully yours,

PHILIP CONNICK



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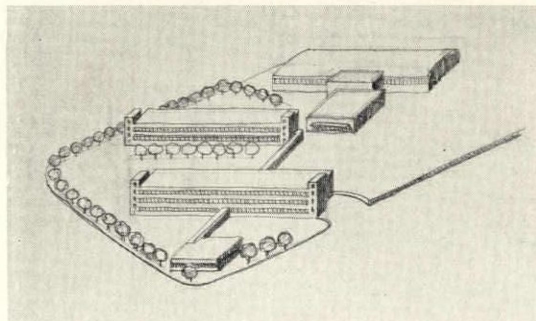


10

October 19, 1934

Dear Philip,

I liked your little speech and your sketches. You are on the right track. I don't know of any Junior High to which to direct Mr. Castle. There is, however, a good elementary school in Hamburg by Fritz Schumacher and a stimulating one in Villejuif near Paris by André Lurcat. I will get you photographs of these. In the meantime, here is the list of the special rooms required in a New York Junior High and their approximate sizes as expressed in terms of the unit, you remember 24 x 28 ft. equals one unit, etc.

Science 1, Biology 1, Biology Laboratory 1½, Typewriting 1, Office Practice 1½, Machine Shop 2, Woodworking 2, Electric Wiring 1, Sheet Metal 1½, Printing 1½, Drawing Room 1½, Music 1½, Library 2.

And then also: Cooking Room 1, Homemaking 1, Sewing 1½, Novelty Shop 1, Millinery 1, Dressmaking 1½.

To these you should add a cafeteria. And you should recommend very strongly a swimming pool. I would much rather have only one gymnasium and one swimming pool than two gymnasiums and no swimming pool.

Cheer up,

LESCAZE

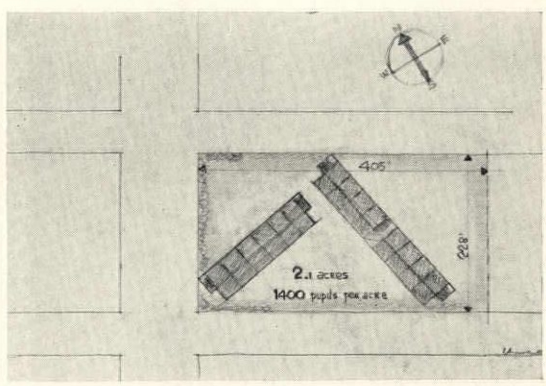
October 26, 1934

Postal Telegraph

Lescarzarch, New York.

228 feet on avenue from street to street 405 feet along both streets impossible to know whether ground slopes or not.

PHILIP

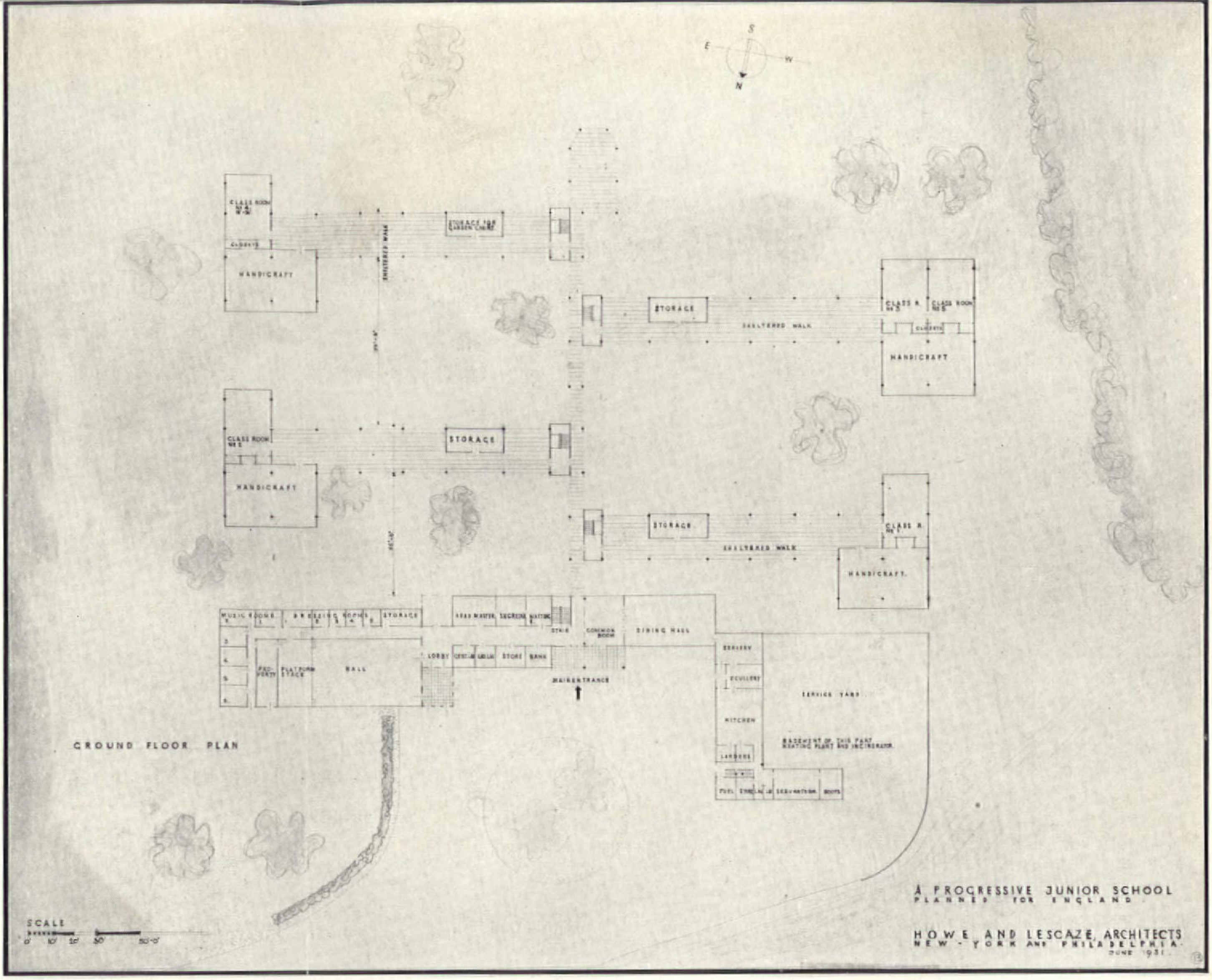


11

October 28, 1934

My dear Philip,

I received your wire. Now see for yourself what it means. That's great modern planning indeed for a town like yours! (Sketch 11.) Fourteen hundred pupils per acre! You'll soon be able to claim better and bigger slums than New York.

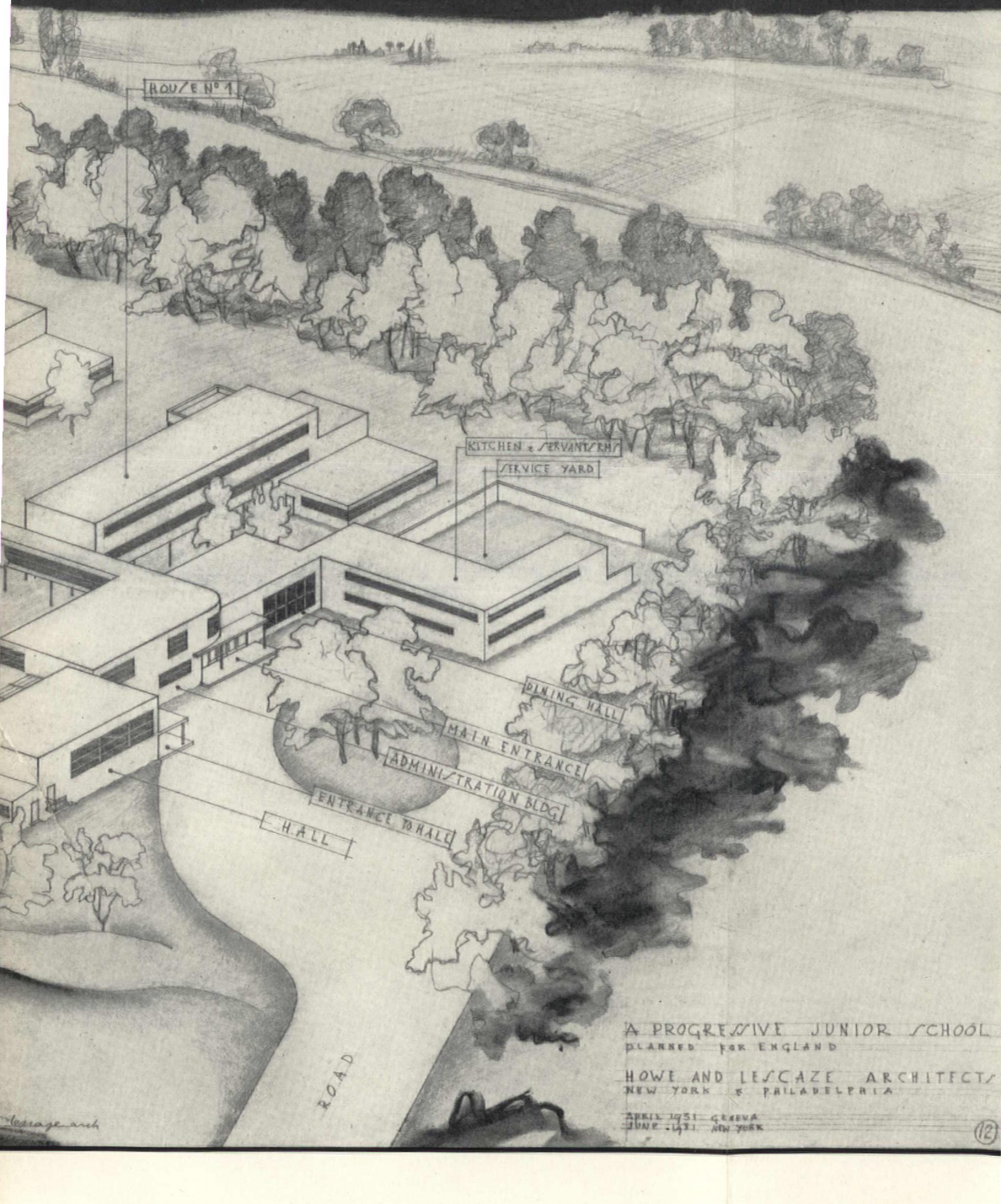


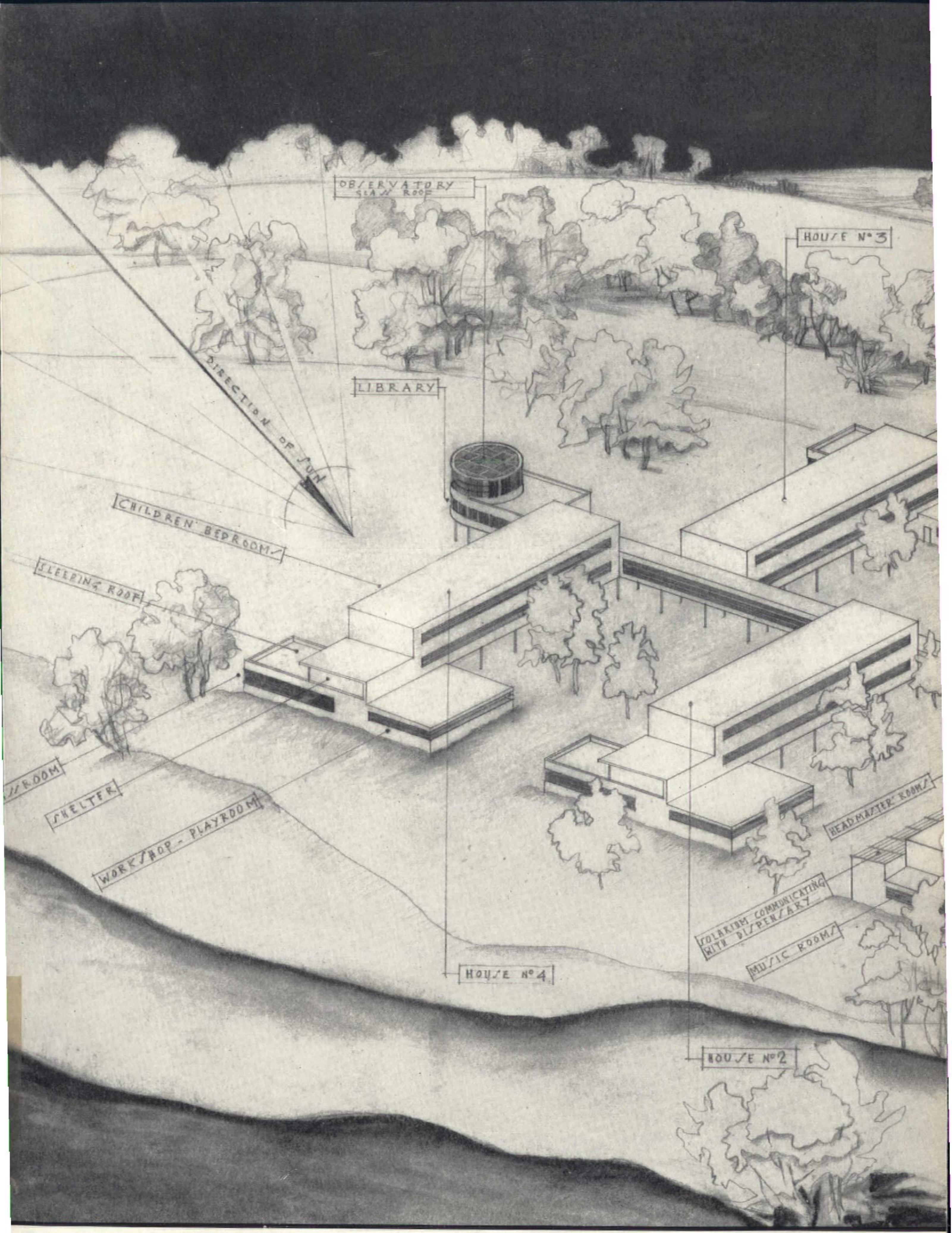
13

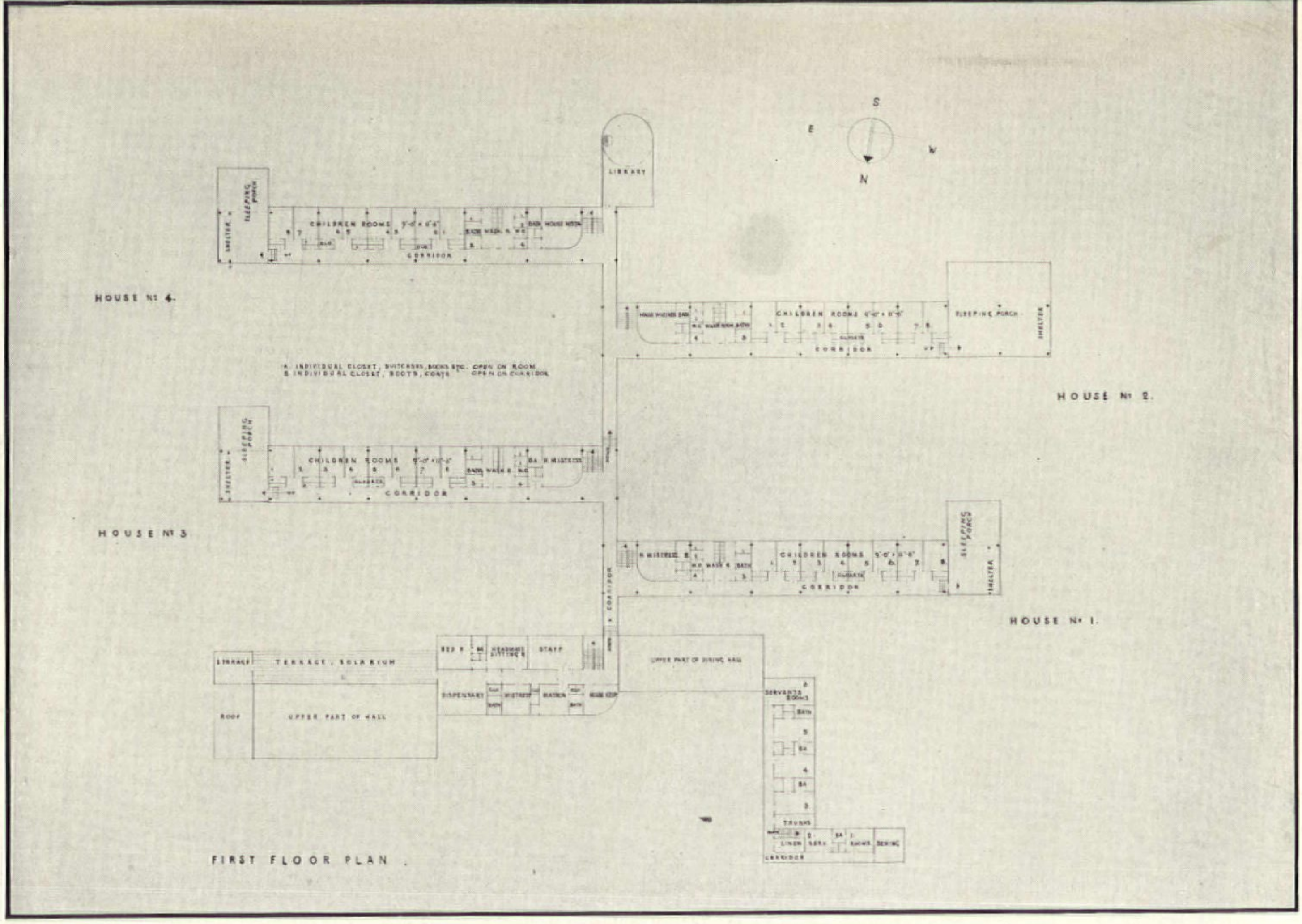
A PROGRESSIVE JUNIOR SCHOOL

Planned for England

Howe and Lescaze, Architects


HOUSE Nº 1
KITCHEN & SERVANTS RMS
SERVICE YARD
DINING HALL
MAIN ENTRANCE
ADMINISTRATION BLDG
ENTRANCE TO HALL
HALL
ROAD
A PROGRESSIVE JUNIOR SCHOOL
PLANNED FOR ENGLAND
HOWE AND LESCAZE ARCHITECTS
NEW YORK & PHILADELPHIA
APRIL 1931 GENEVA
JUNE 1931 NEW YORK
12
lescaze arch


OBSERVATORY
GLASS ROOF
HOUSE Nº 3
DIRECTION OF SUN
LIBRARY
CHILDREN BEDROOMS
SLEEPING ROOF
SHELTER
WORKSHOP - PLAYROOM
HEADMASTER ROOMS
SOLARIUM COMMUNICATING WITH DISPENSARY
MUSIC ROOMS
HOUSE Nº 4
HOUSE Nº 2


LIBRARY
S
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W
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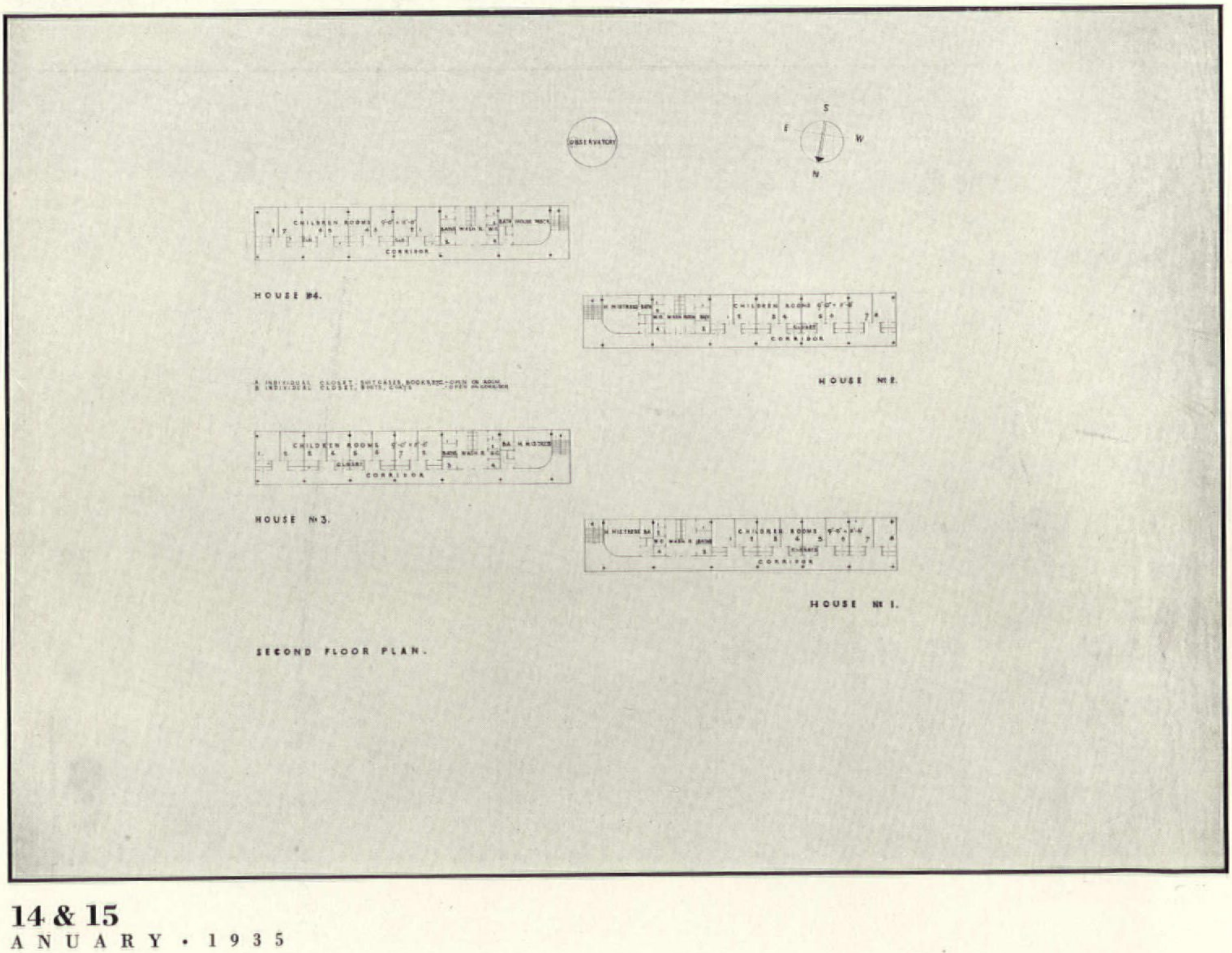
HOUSE Nº 4.
HOUSE Nº 2.
HOUSE Nº 3
HOUSE Nº 1.
CHILDREN ROOMS
CORRIDOR
SLEEPING PORCH
SHELTER
TERRACE, SOLARIUM
UPPER PART OF HALL
UPPER PART OF DINING HALL
STAFF
DISPENSARY
MATRON
SERVANTS ROOMS
TRUNKS
LINEN
SEWING
FIRST FLOOR PLAN.


OBSERVATORY
S
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CHILDREN ROOMS
CORRIDOR
HOUSE Nº4.
HOUSE Nº2.
HOUSE Nº3.
HOUSE Nº1.
SECOND FLOOR PLAN.

The two can't altogether be compared. But just the same, if 200 people per acre is crowded housing in New York, what can 1,400 pupils do in your town on one acre! Or compare it with the sizes recommended for a gymnasium. Here the pupils have a period of physical training every school day, and since the school day is divided in seven periods, the gymnasium or gymnasiums must accommodate one-seventh of the total enrollment. Thirty square feet is allowed for each pupil. In your case 2,910 pupils x 30 divided by 7, equals 12,475 sq. ft. Two such gymnasiums 24,950 sq. ft., or in round figures 25,000 sq. ft. Add another 6,000 sq. ft. for the auditorium. Your plot is 92,340 sq. ft. You can't build it all up. What coverage will you have? Forty per cent shall we say? That's pretty high. It's higher than recognized good housing. Well, 40 per cent of 92,340 is 36,936. What have you left after you take off 31,000 for two gymnasiums and one auditorium?

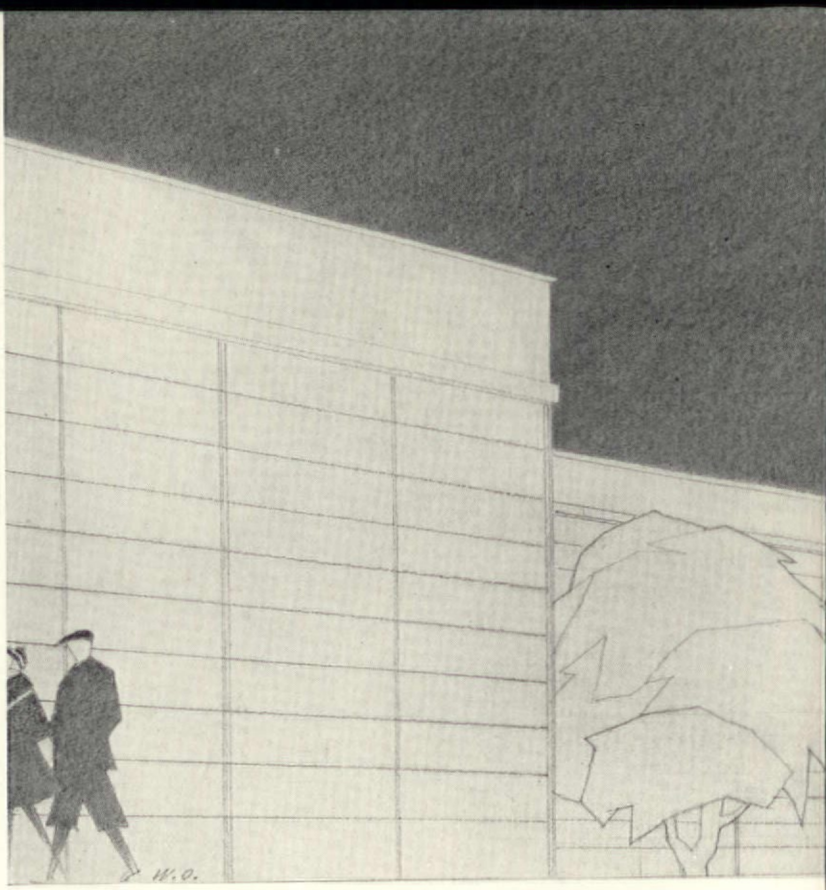
Your plot is too small, Philip. I place the classrooms so as to give them east and west light and the special rooms with north and south light (drawing and printing might be on the north), but there isn't any ground left to speak of for one auditorium and two gymnasiums. It's true you could build in height. But why should you have to climb and climb stairs? Three stories are all you should reasonably have to go. Sorry, Philip, but you'll have to educate your School Board and you'll have to get a larger plot. If it helps you at all, although it's a solution for the country, here are some drawings of a Junior High project. (Drawings 12, 13, 14, 15.) The problem was to plan a boarding school in which the children were to be housed in four houses, each house to have a classroom and one other room (common room, workshop, etc.) added to it. There were to be in addition a library, observatory, a hall and a central dining room and kitchen. In addition to these specifications it was suggested that the classrooms should be separated from each other in order to diminish noise and congestion. It was felt that each house ought to have a southern exposure for all the children's rooms and this fact in itself was a reason for not disposing them about a quadrangle. The four houses are, therefore, placed like branches from a tree, reaching out alternately on either side of a communicating corridor. In each house the corridor itself is on the north side and all the living quarters face south. The houses are built on short columns which provide both sheltered walks between classrooms at the ends of the houses and also opportunity for continuous enjoyment of the landscape which, near that particular site, is soft and rolling and heavily planted with old trees. At the end of each house the classroom has an east, south and west exposure and the roof, which is partly sheltered, may be used as a sleeping porch.

At the far end of the main corridor stands a library with a circular observatory on its roof. As we enter the building we find on the left the offices and an auditorium, and on the right the dining room and kitchen quarters.

Now again, better luck with the next project, Philip! You have at least learned the essentials in finding out a method with which to analyze a problem. And you have begun to learn how to think and how to explain as clearly as possible your reasons. If I can be of any help at any time, be sure to let me know.

Sincerely,

LESCAZE



A HIGH SCHOOL FOR THE COMMUNITY

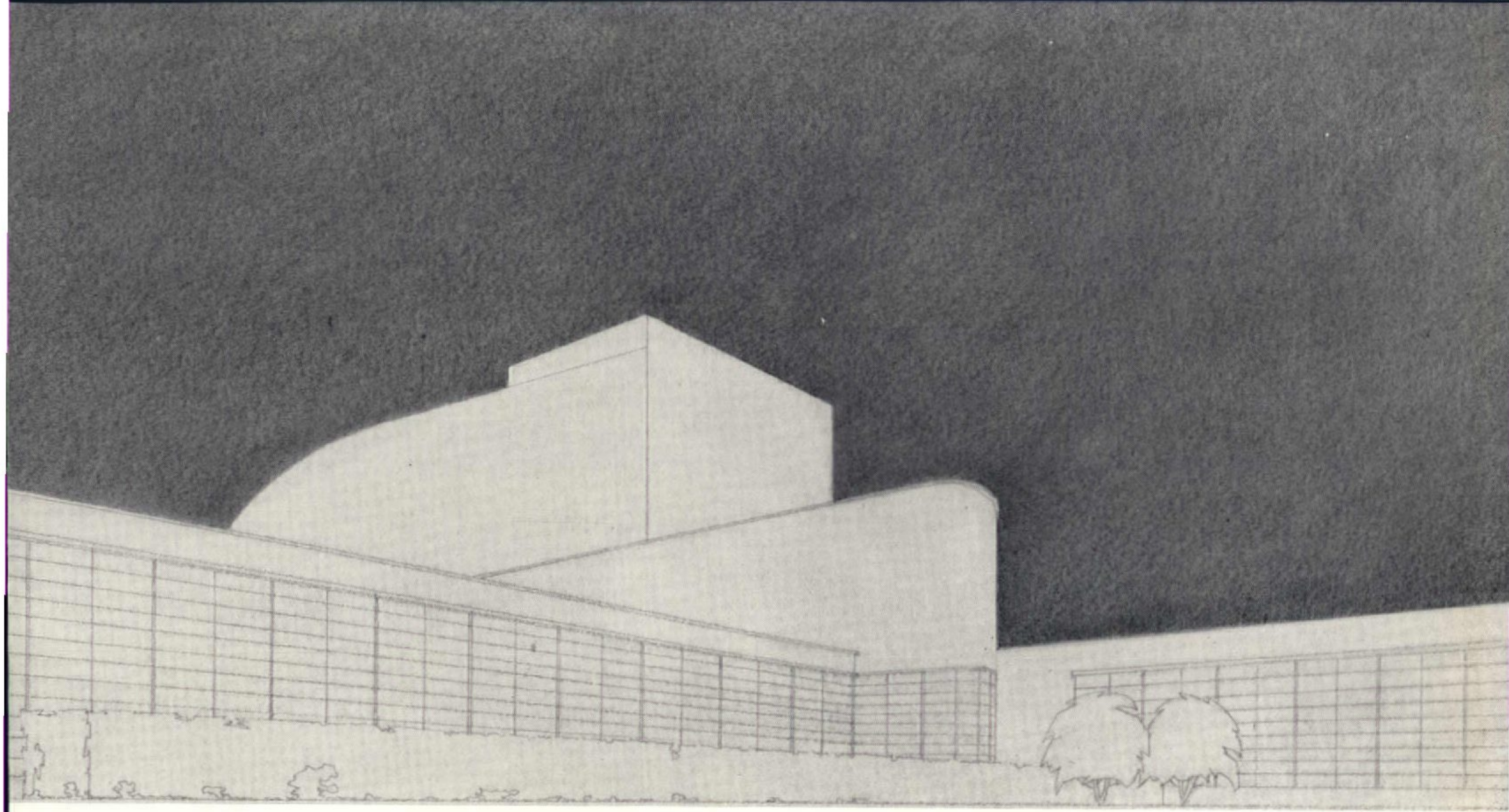
Which provides the modern social necessities required by changing conditions of today.

By

WALLACE K. HARRISON, A.I.A.

Assisted By

W. K. Oltar-Jevsky, Max Abramowitz and E. H. Harrison

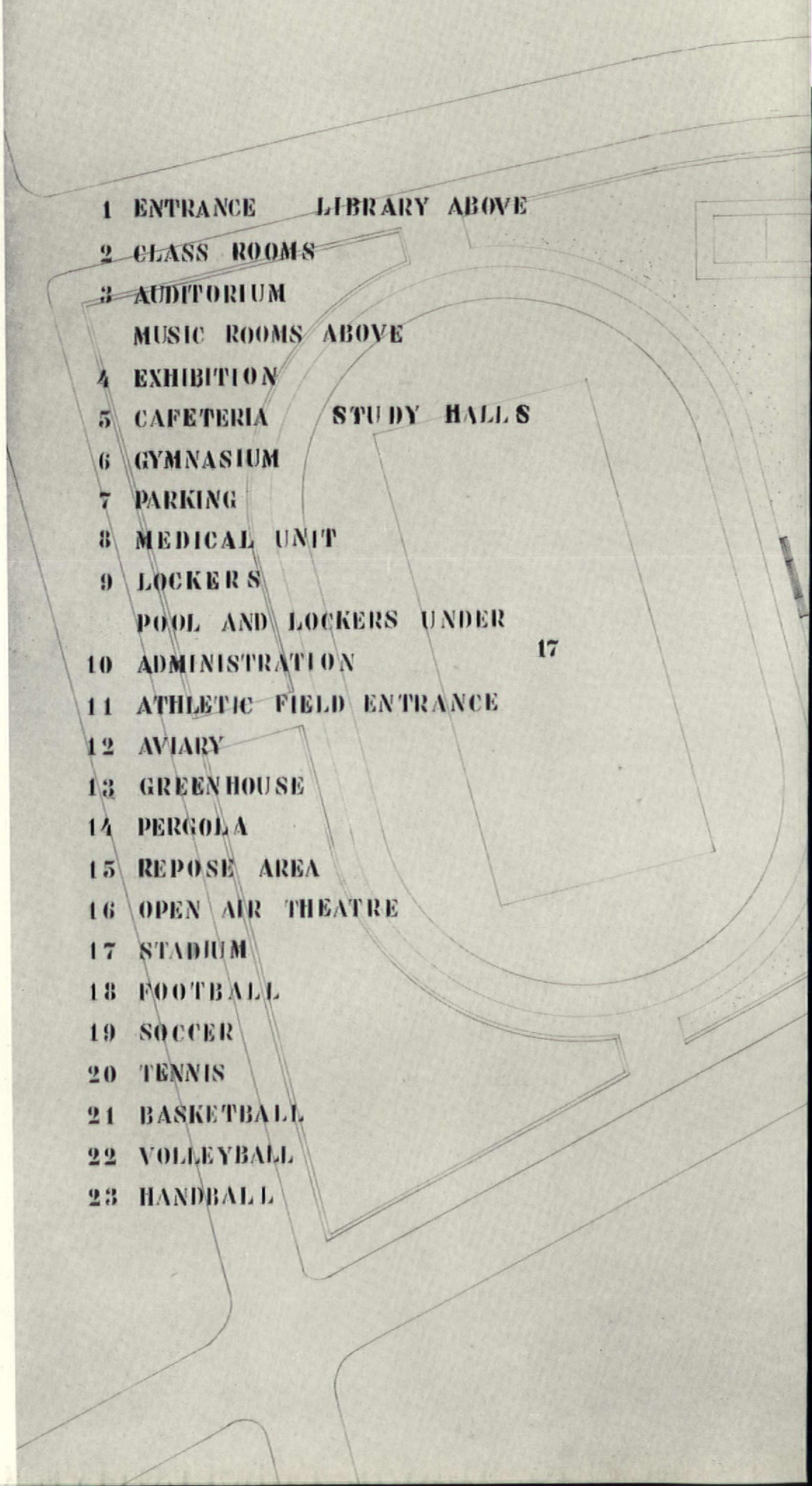


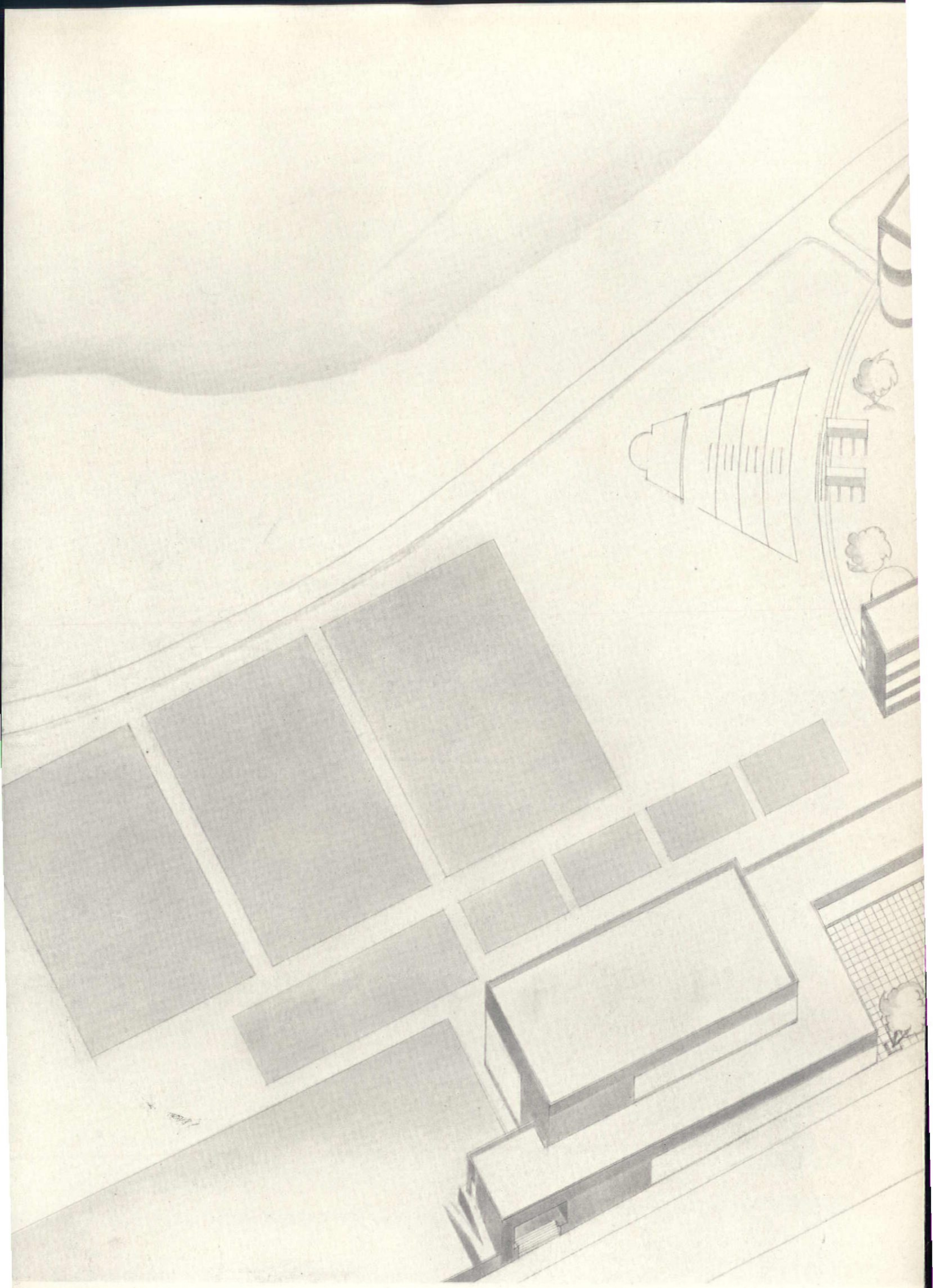
After the war Mayor Hylan pushed the building program for New York's schools to catch up with the shifts in population and the building shortage. De Witt Clinton High School was built at this time. Designed by William H. Gompert and Clarence Dobbin it was the last word in educational plants. Changing conditions make it possible, without criticism of the earlier building, to show what might be done now to handle the same 5,200 pupils on the same plot of ground.

The elaborate plant of the past is not used the maximum possible number of hours in the day nor months in the year. This sort of colossus must, today, be of wider use to the community. It should provide the modern social necessities such as clinic, visiting nurses, library, museum, physical recreation for adults, club center, community theater, children's theater, adult education night school, Americanization, leisure time activities, and school gardens.

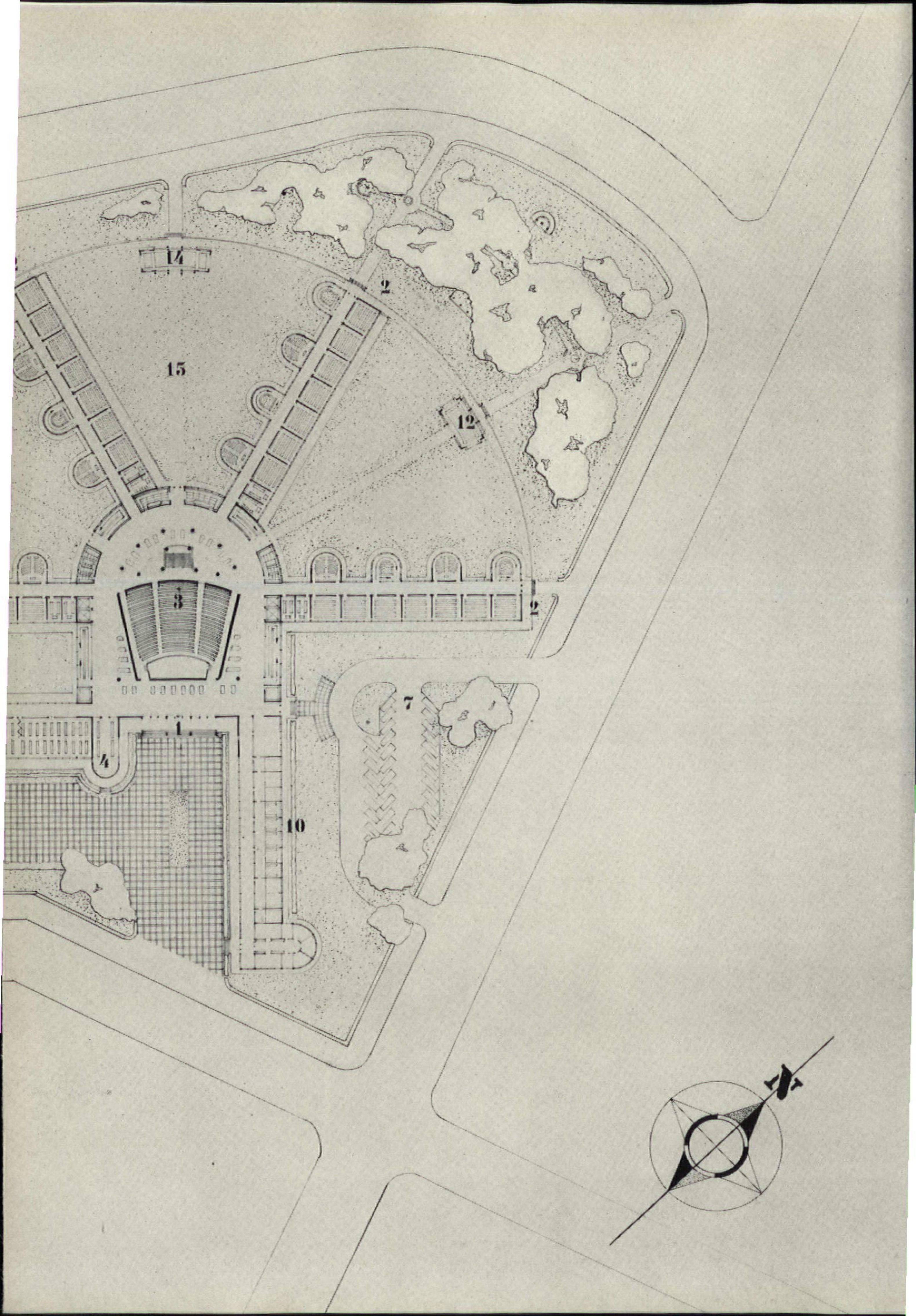
A COMMUNITY

Improvements of this 1935 scheme over the earlier building are: The elimination of stairs which are replaced with ramps, the placing of the cafeteria outside of the classroom unit to secure freedom from cooking odors, the placing of the gymnasium where sounds will not disturb students in the classroom, the lighting of all corridors with natural light. In this way each unit may be completely shut off when not in use. This offers many possibilities for economy in operation and promotes greater ease and flexibility in use for community activities at such times as the school itself is not functioning. These advantages should outweigh the possibly greater first cost.





ISOMETRIC AERIAL PERSPECTIVE OF THE HIGH SC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2
15
12
3
2
7
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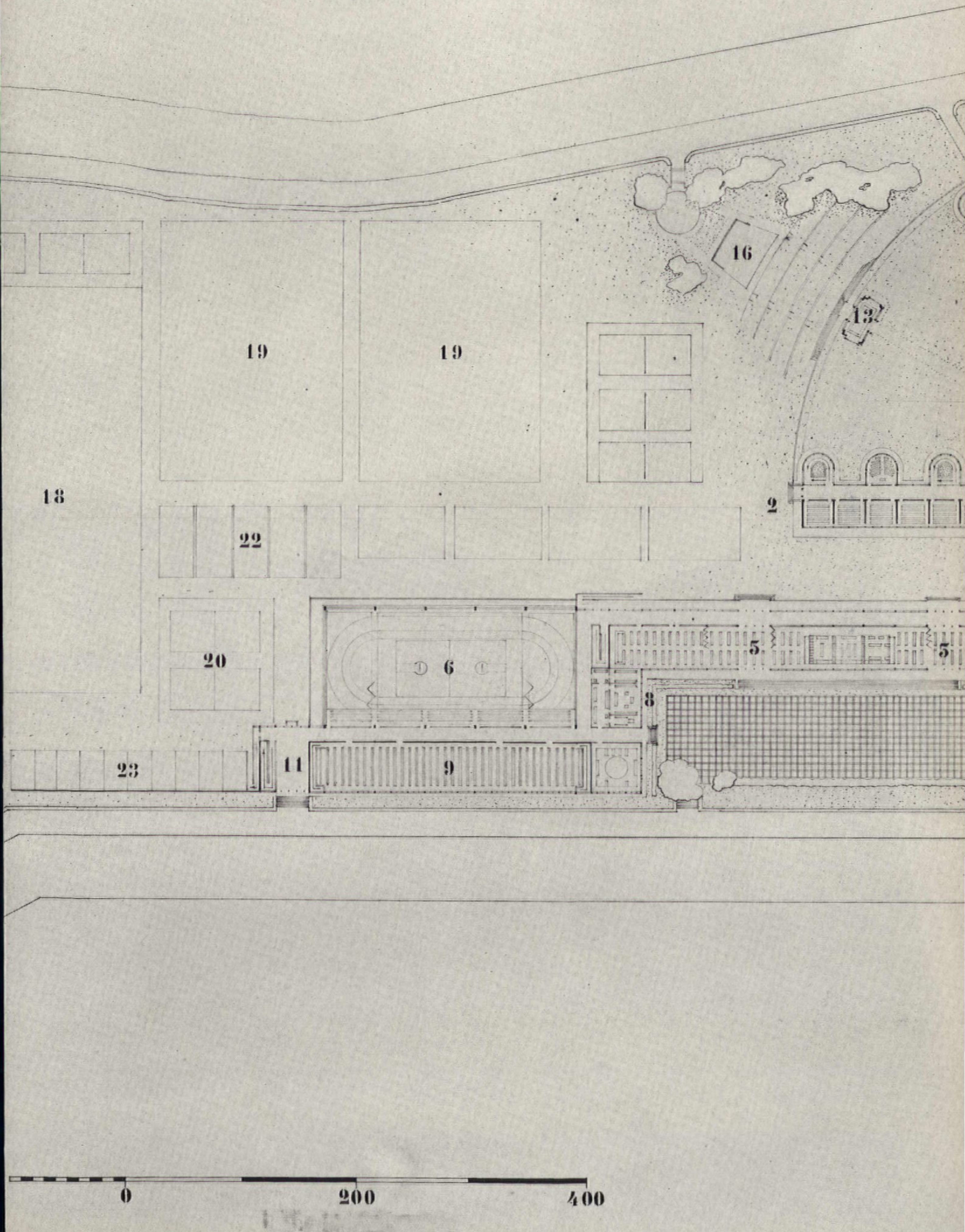
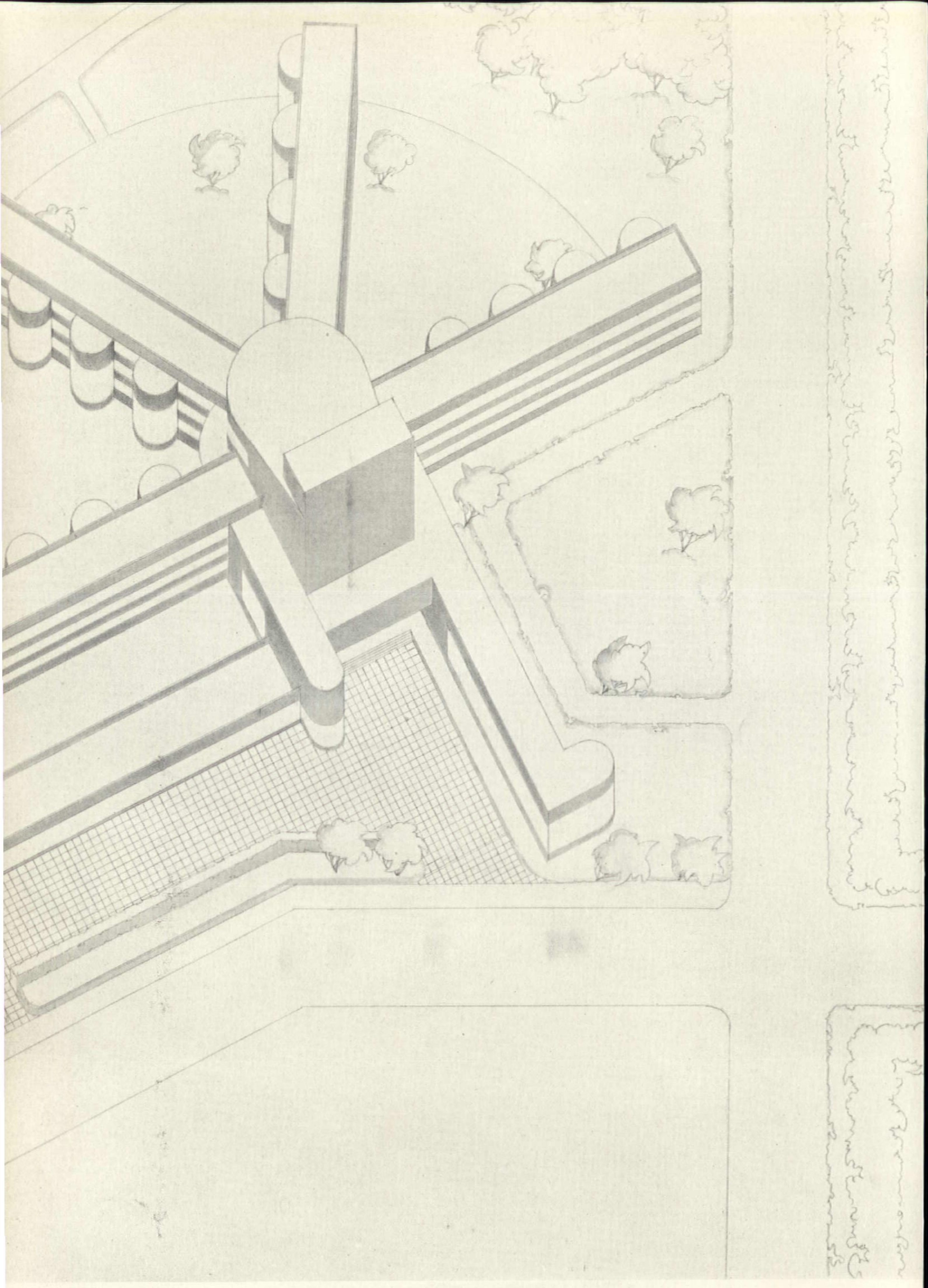
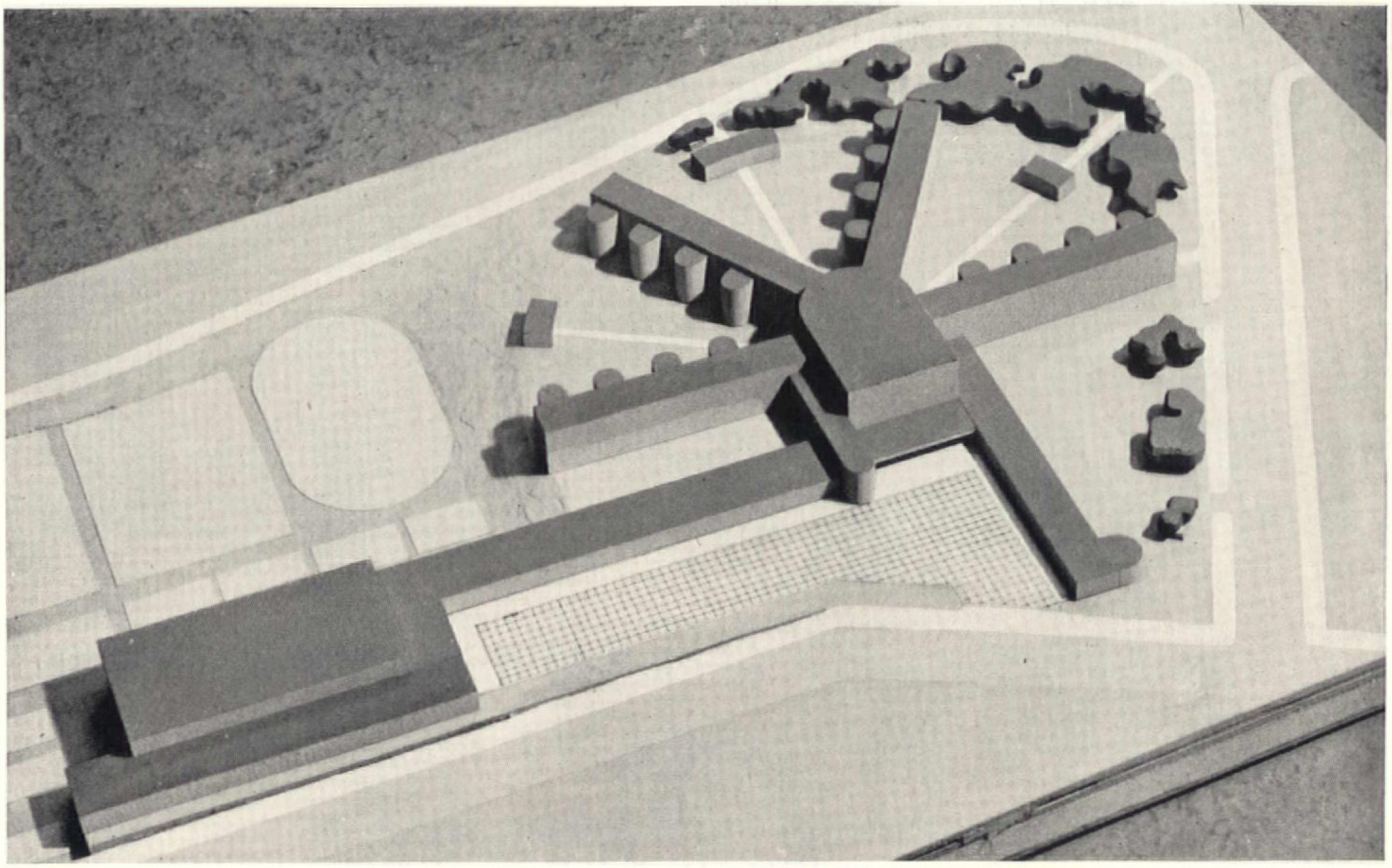
10
N

GH SCHOOL

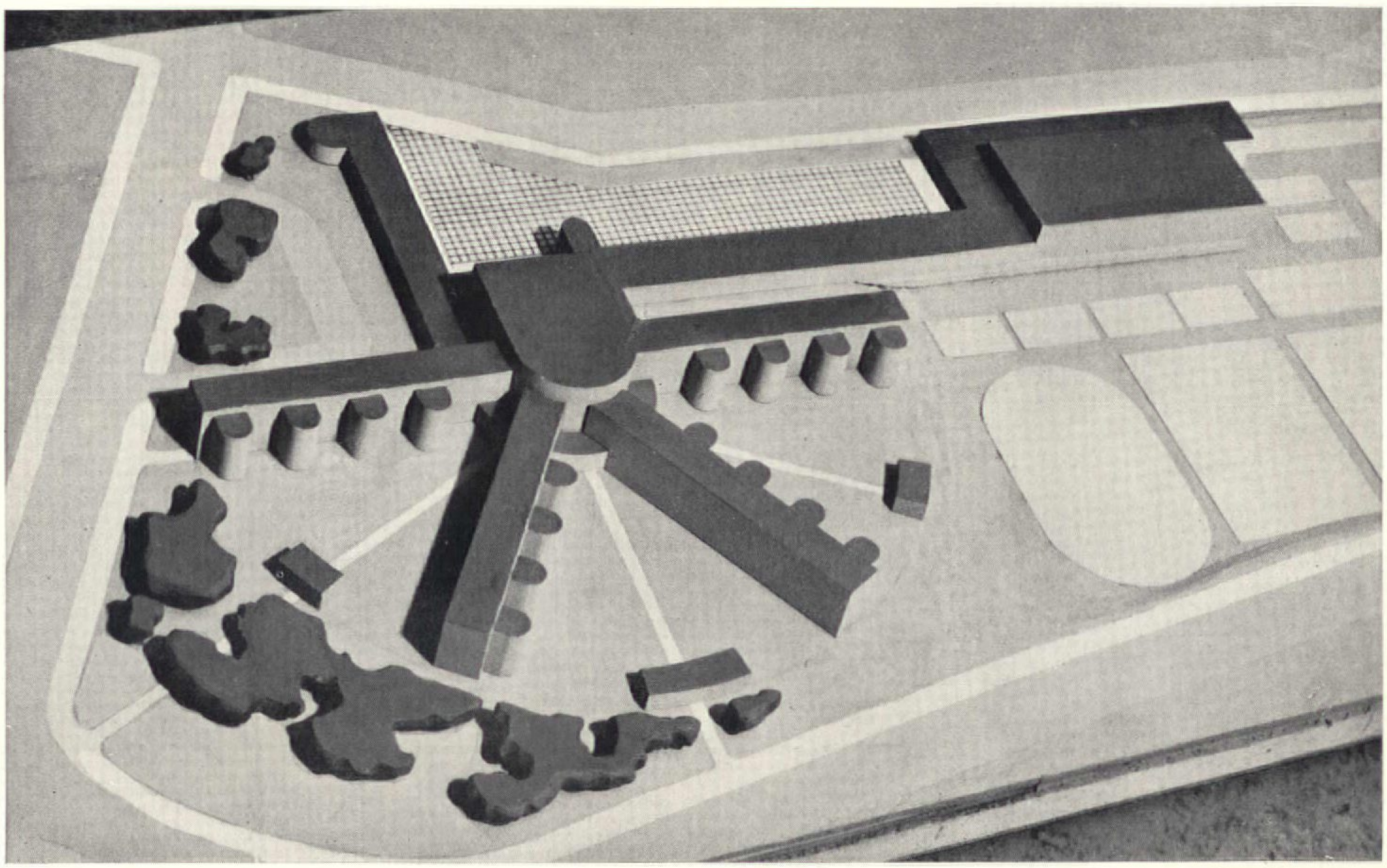




HOOL FOR A COMMUNITY

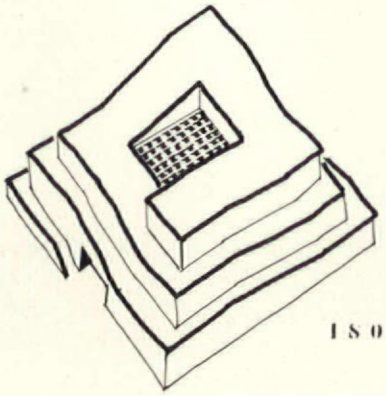


ORIENTATION FOR ILLUMINATION BY MORNING SUNLIGHT

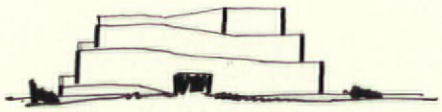


—AND FOR ILLUMINATION BY EVENING SUNLIGHT

A UNIT SCHOOL
EVERY CLASS ITS TERRACE

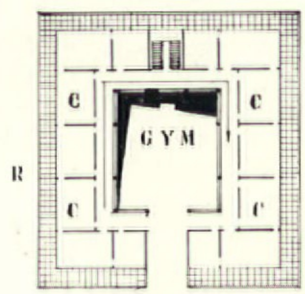


ISOMETRIC



AN EXPRESSION

SECTION



PLAN

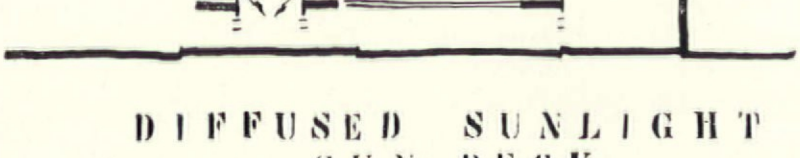
C. Classrooms.

A SCHOOL FOR RADIO CONTROL

After having arrived at a solution of this problem, however, certain questions suggest themselves. Doesn't this kind of educational factory dwarf the pupil? How important, psychologically, is the relation of the child to this huge institution? The more one thinks on this subject the greater is the inclination to prefer a smaller unit. The large school is held to be a saving. Is the cost of transportation for both pupil and teacher calculated?

A better solution might be a much smaller school with balconies outside each classroom, as used in England, with set-backs for light. This type of school could be subject to a central administration that covers a group of such buildings. The classrooms would be wired for sound and lectures given by radio and cinema.

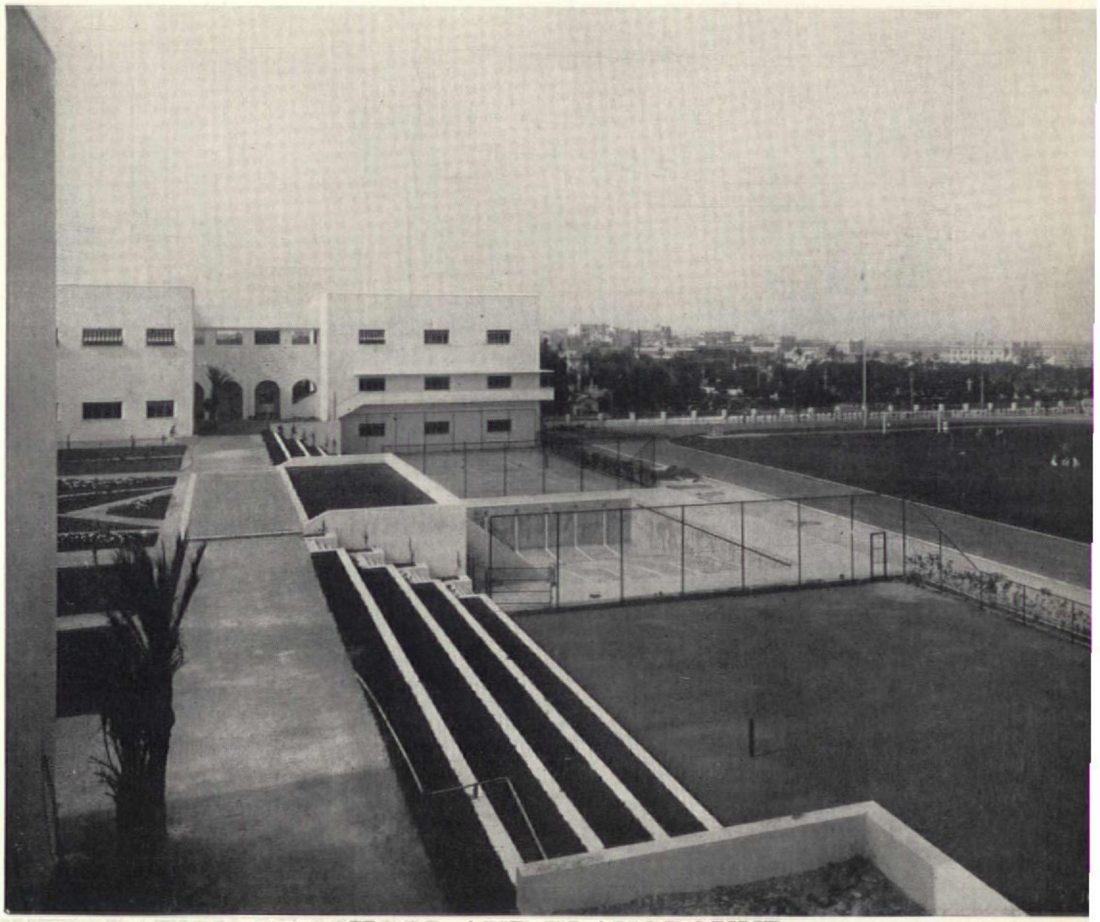
These hasty sketches show a suggestion for such a school, an attempt to break away from the vast institution. These have been added here because the months of study which produced the first plan have left the feeling that education and architects may be on the wrong track—too much influenced by the boom years.



DIFFUSED SUNLIGHT
SUN DECK

EUROPE SHELTERS EDUCATION

European schools selected and presented for their solutions of problems which perplex educators and architects the world over.

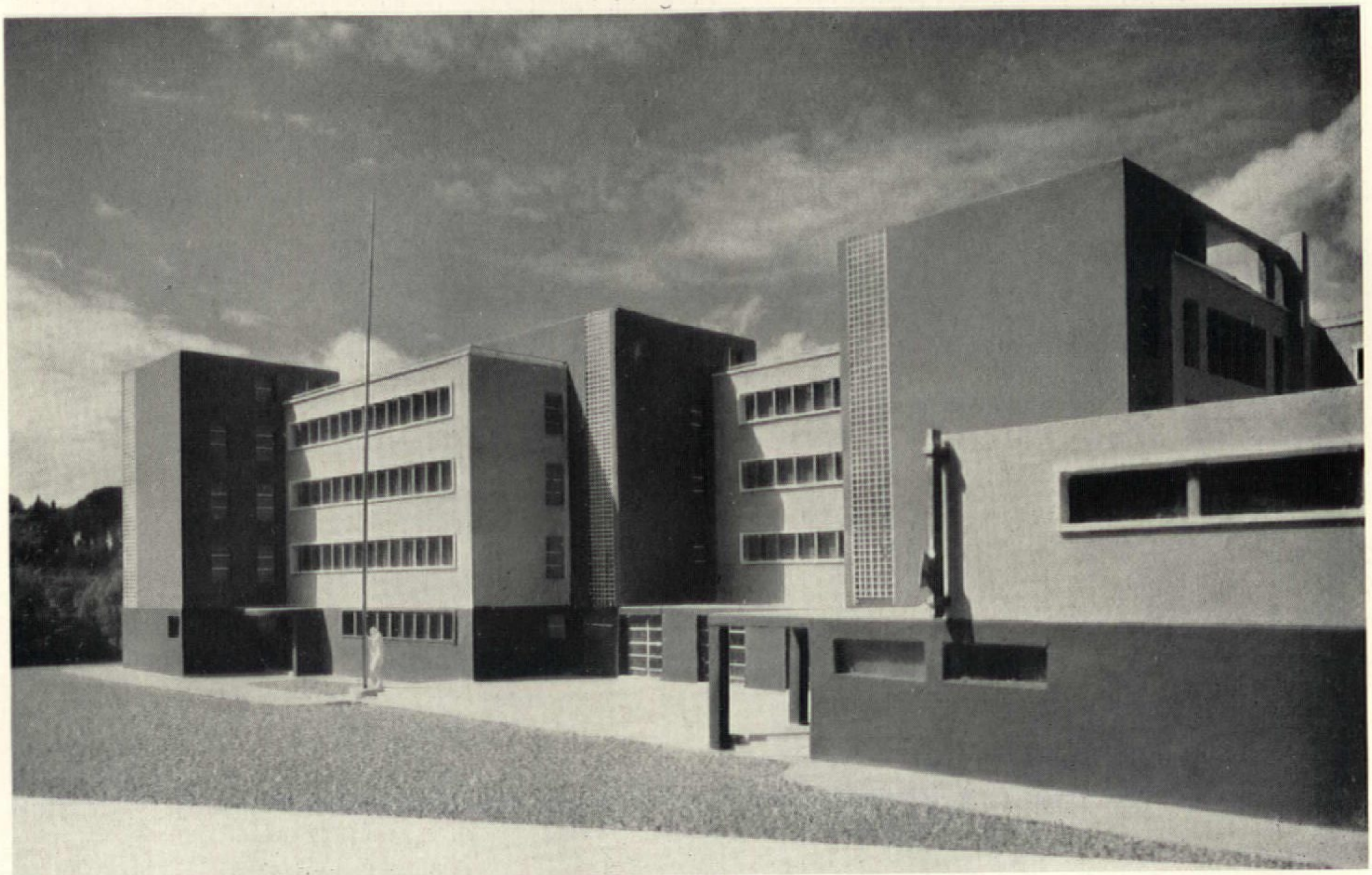


INTEGRATION OF SCHOOL AND PLAYGROUND

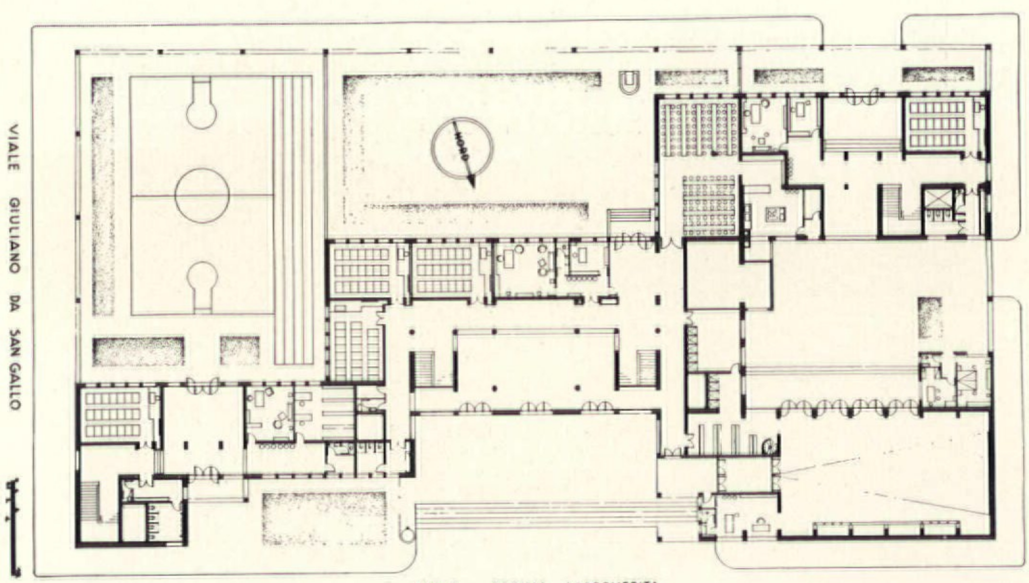
EGYPT

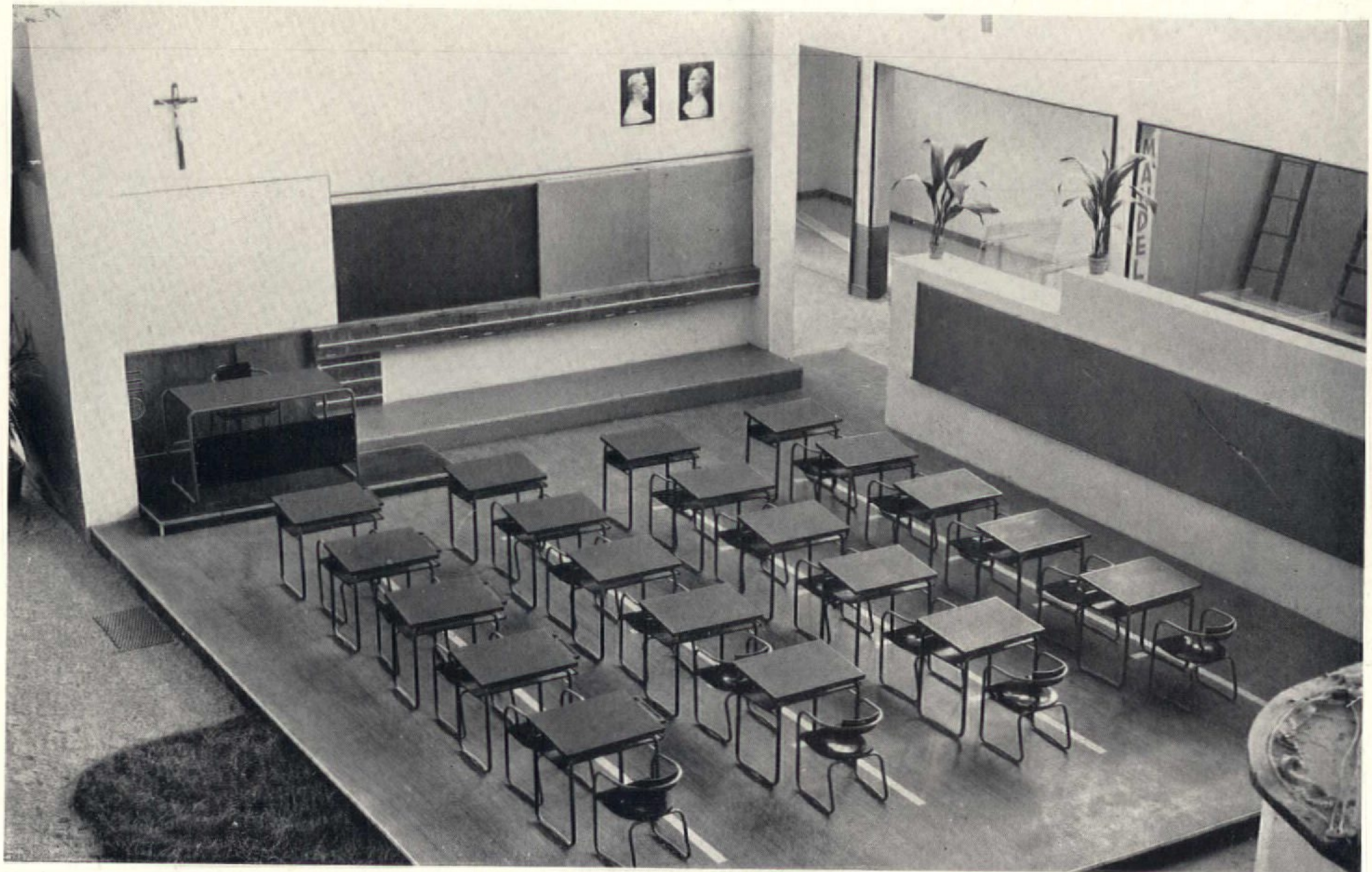
Terraces may be used as a grandstand for the tennis courts and for the track and football field beyond. The raised center provides a tribune for speeches as well as an elevated platform for viewing water sports.

ITALIAN SCHOOL IN ALEXANDRIA
BUSIRI VICI, ARCHITECT



ORGANIZATION OF A CONSOLIDATED SCHOOL



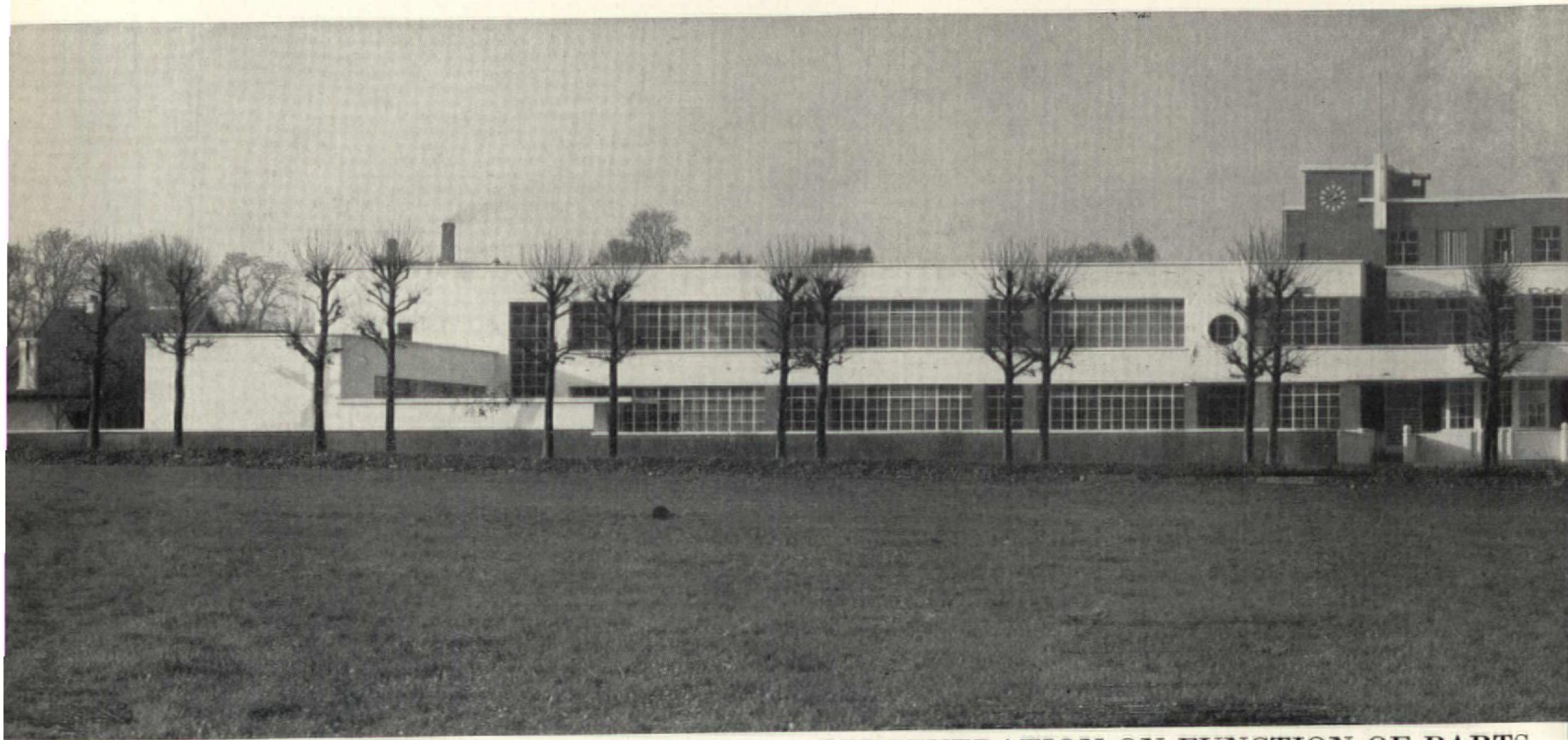


MODERN ITALIAN CLASSROOM EQUIPMENT

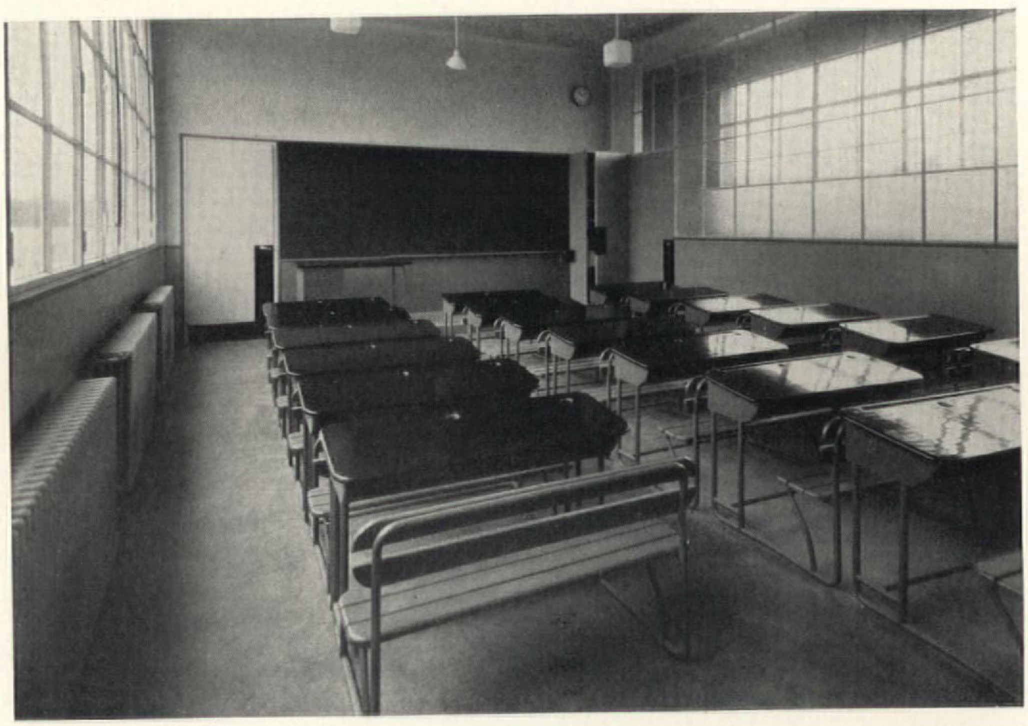
This plan achieves remarkable separation of the various elements while permitting cross-connection where desirable and making full use of the orientation. At the left of the plan is the intermediate school with separate recreation area. Center is the elementary school on a somewhat higher level. It has individual play space and a dining room. Right, at the top, is the manual training school with its own entrance. Below this is the gymnasium with necessary adjuncts. The orientation is remarkable for so complex a plan. Above the first story all three schools are set back to a single classroom width giving daylight on both sides.

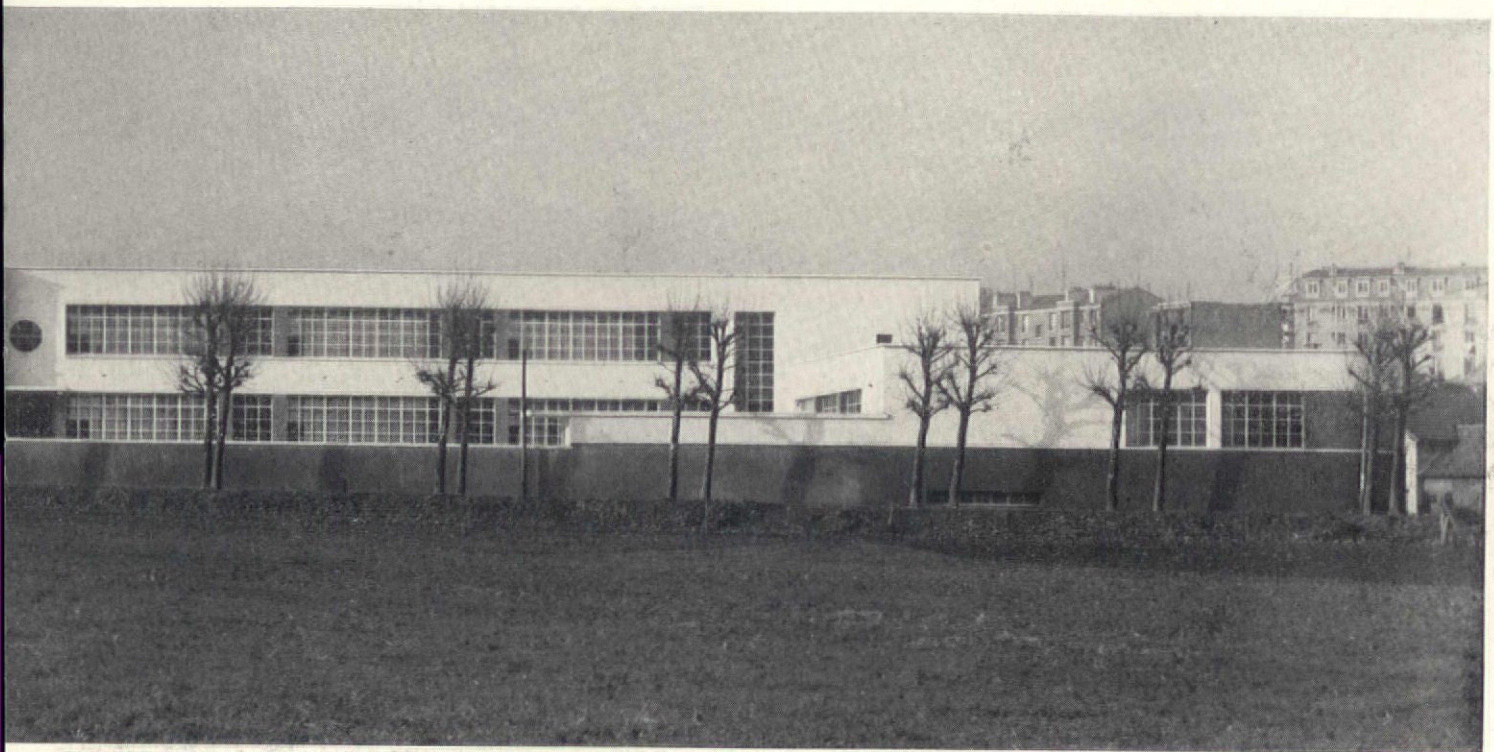
School under construction at Ostia

Ignario Guidi, Architect

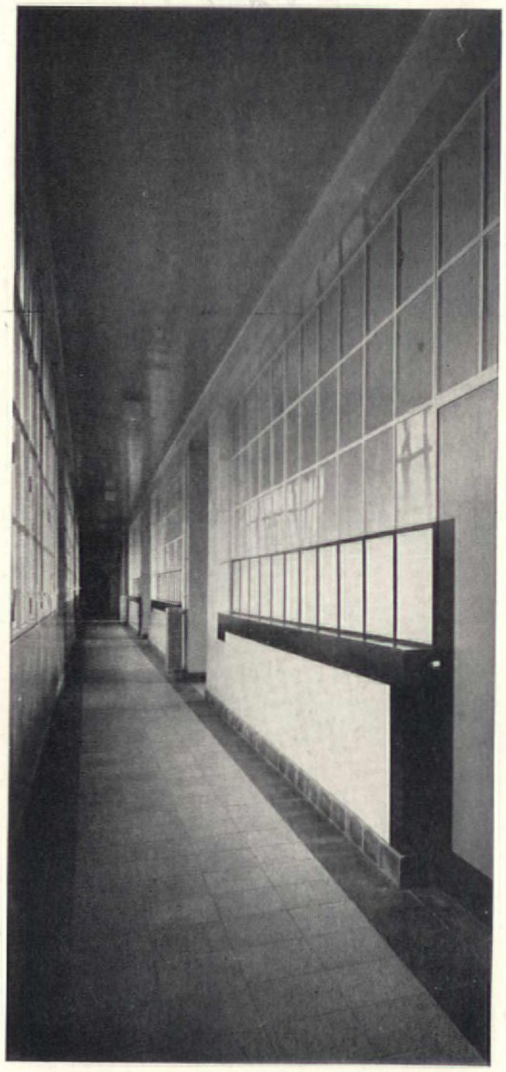


CONCENTRATION ON FUNCTION OF PARTS





ESTHETIC CONSIDERATION OF THE WHOLE



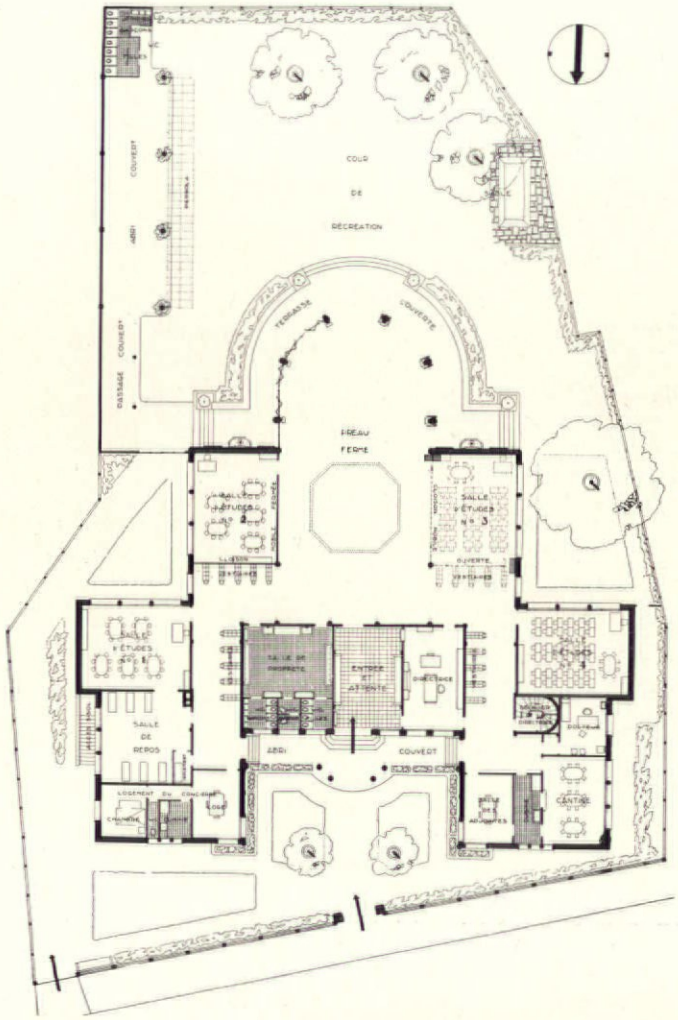
An insistence upon function does not exclude esthetic determination. This school has none of the coldness of appearance associated in many minds with modern design. The classroom shows the value of bilateral lighting through the corridor. The obscured glass in the lower row of panes prevents passing children or teachers from disturbing the occupants. The furniture, although open to criticism because its units seat two children, is less likely than the Italian to be displaced by fidgeting. Notice that the blackboard has a lighting fixture of its own with special reflector.

School Group Paul Doumer, Cachan
Chollet, Mathon and Chaussat, Architects

FUNCTIONAL PLANNING OF THE KINDERGARTEN

When it rains there is plenty of play space that is under cover yet adequately lighted. On fine days the entire semicircular wing may be opened and complete integration of indoor and outdoor play achieved. Extra toilets at the far side of the outdoor playground eliminate the passing of children through the building while others are using the central play space. Movable partitions allow two of the classrooms to be thrown into the central space at will. The use of vault lights in the concrete cantilevered slab over the open terrace ensures the maximum of light without sun glare.

KINDERGARTEN AT GENNEVILLIERS F. DUMAIL, ARCHITECT


COUR
DE
RÉCRÉATION
TERRASSE
COUVERTE
PASSAGE COUVERT
PREAU
FERMÉ
SALLE
D'ÉTUDES
Nº 3
VESTIAIRES
SALLE
D'ÉTUDES
Nº 1
SALLE
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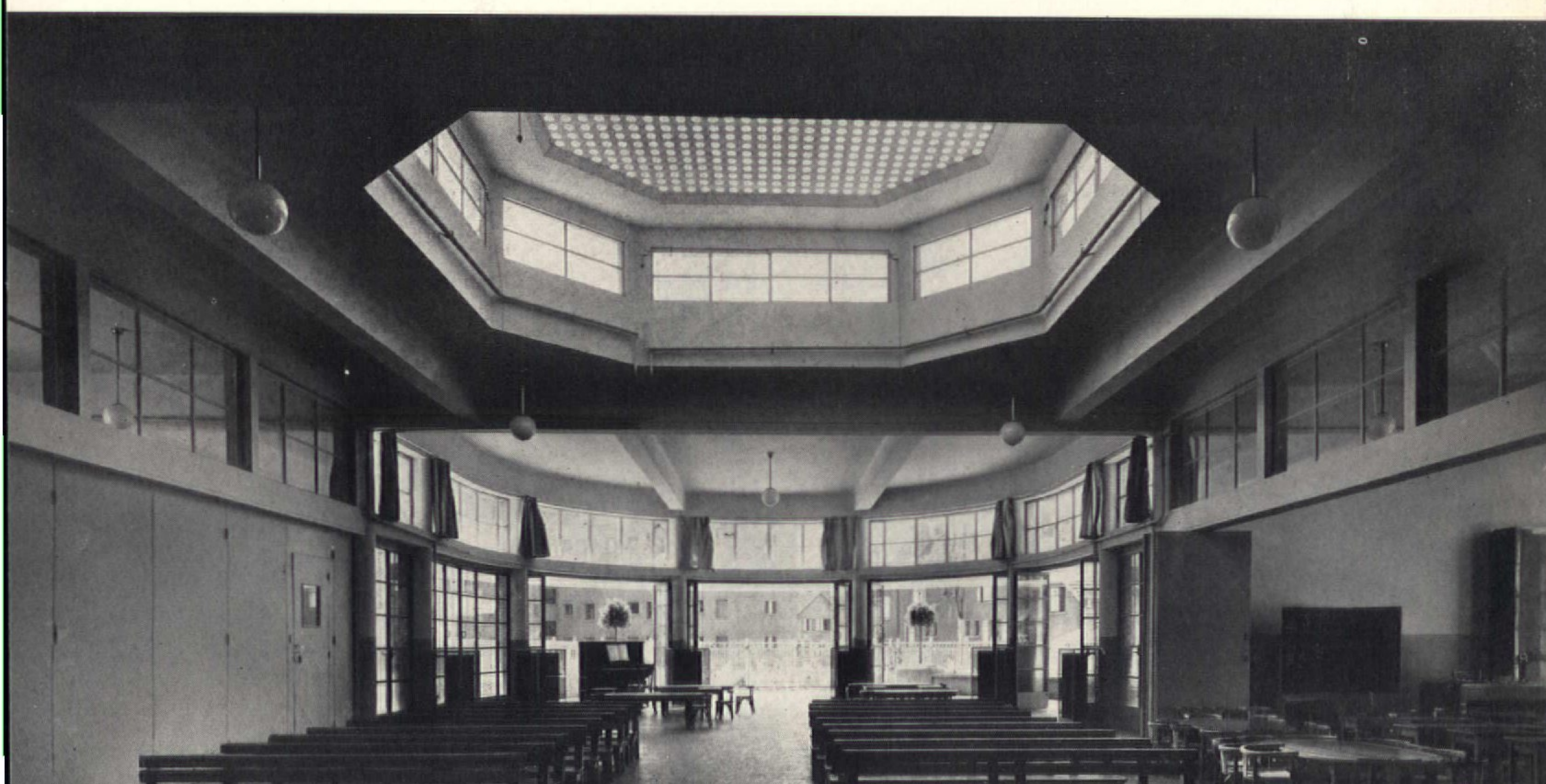
ATTENTE
DIRECTRICE
ABRI
COUVERT
LOGEMENT DU CONCIERGE
CHAMBRE
LOGE
CANTINE



FRANCE

ORGANIZATION OF RECREATION SPACES

The covered passage from one part of the school to the other separates the two play areas. It also provides on its roof a place for children to eat their lunches in the shade of parasols and out of the way of others running about below. Notice that the bilateral lighting of classrooms permits one to see entirely through the building.

School at Alfortville

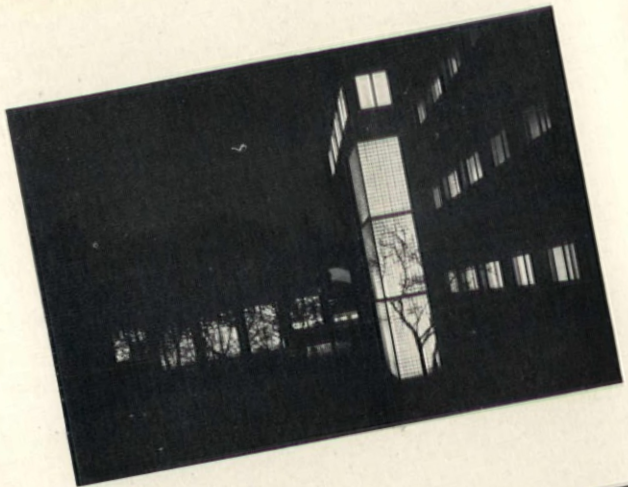
M. G. Gautier, Architect

INTEGRATION OF EDUCATION WITH HOUSING

Too many housing schemes neglect the factor of juvenile education. In Vienna's celebrated Karl Marx Hof, Socialist thought has provided a centrally located kindergarten for the convenience of working mothers who can leave their children there all day.

KINDERGARTEN IN KARL MARX HOF, VIENNA — KARL EHN, ARCHITECT

AUSTRIA



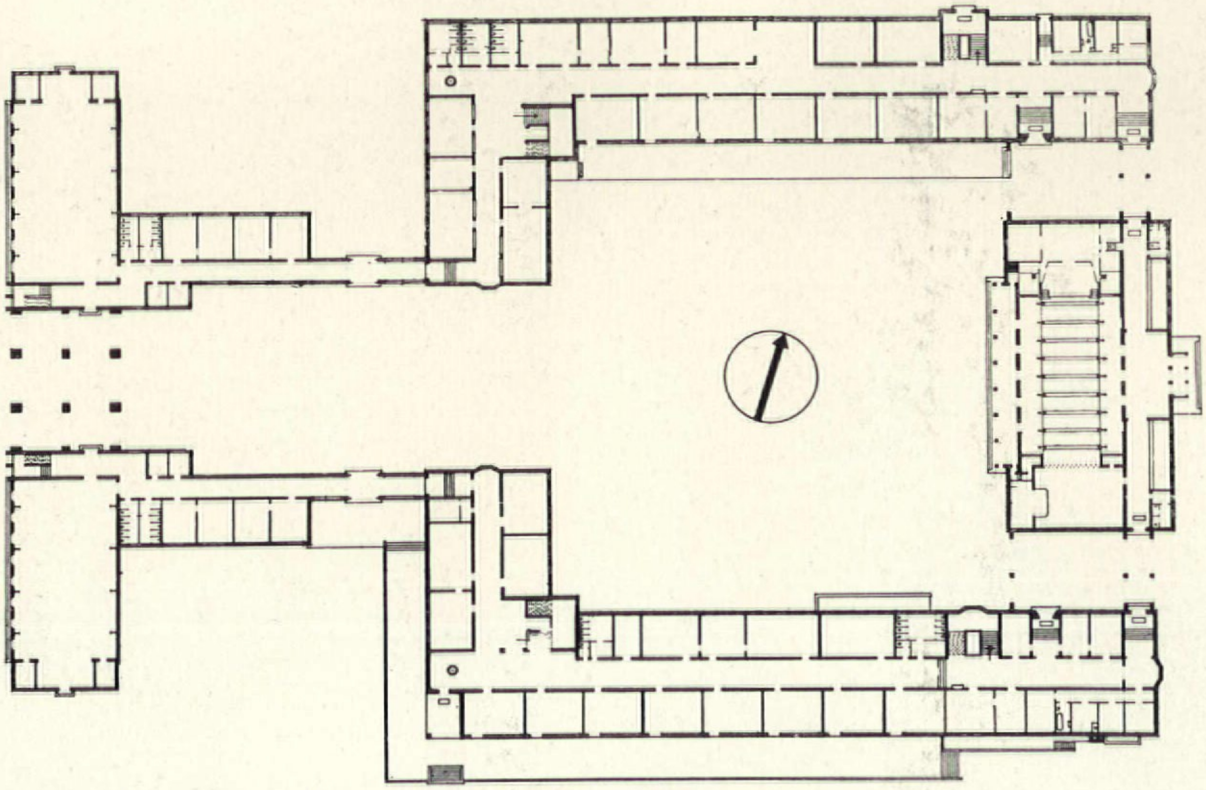
GLASS, DECORATIVE AND STRUCTURAL

Here the sun's patterning of leaf shadows on a plain wall of glass and stucco is infinitely more exciting than the best of ornament could ever be. At night the light that comes through such windows has an interest all its own, heightened by contrast with other expanses of plain glass in large sheets.

GIRLS' INTERMEDIATE SCHOOL, VIENNA

S. THEISS, H. JAKSCH, ARCHITECTS

DOCTORS RUDOLFSKY AND FABJAN, ASSOCIATED

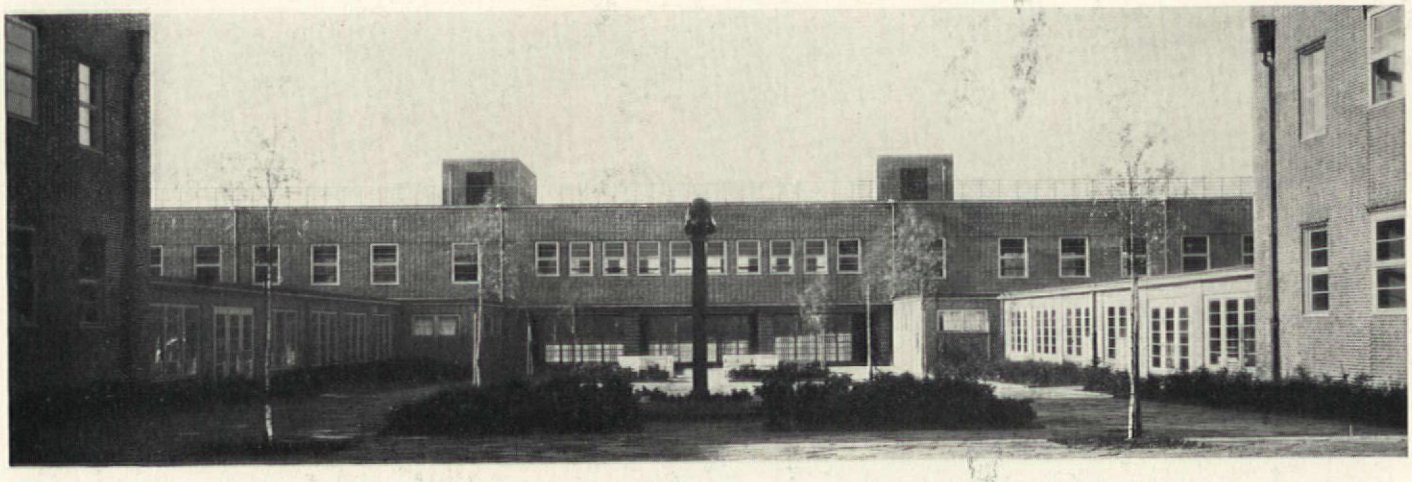


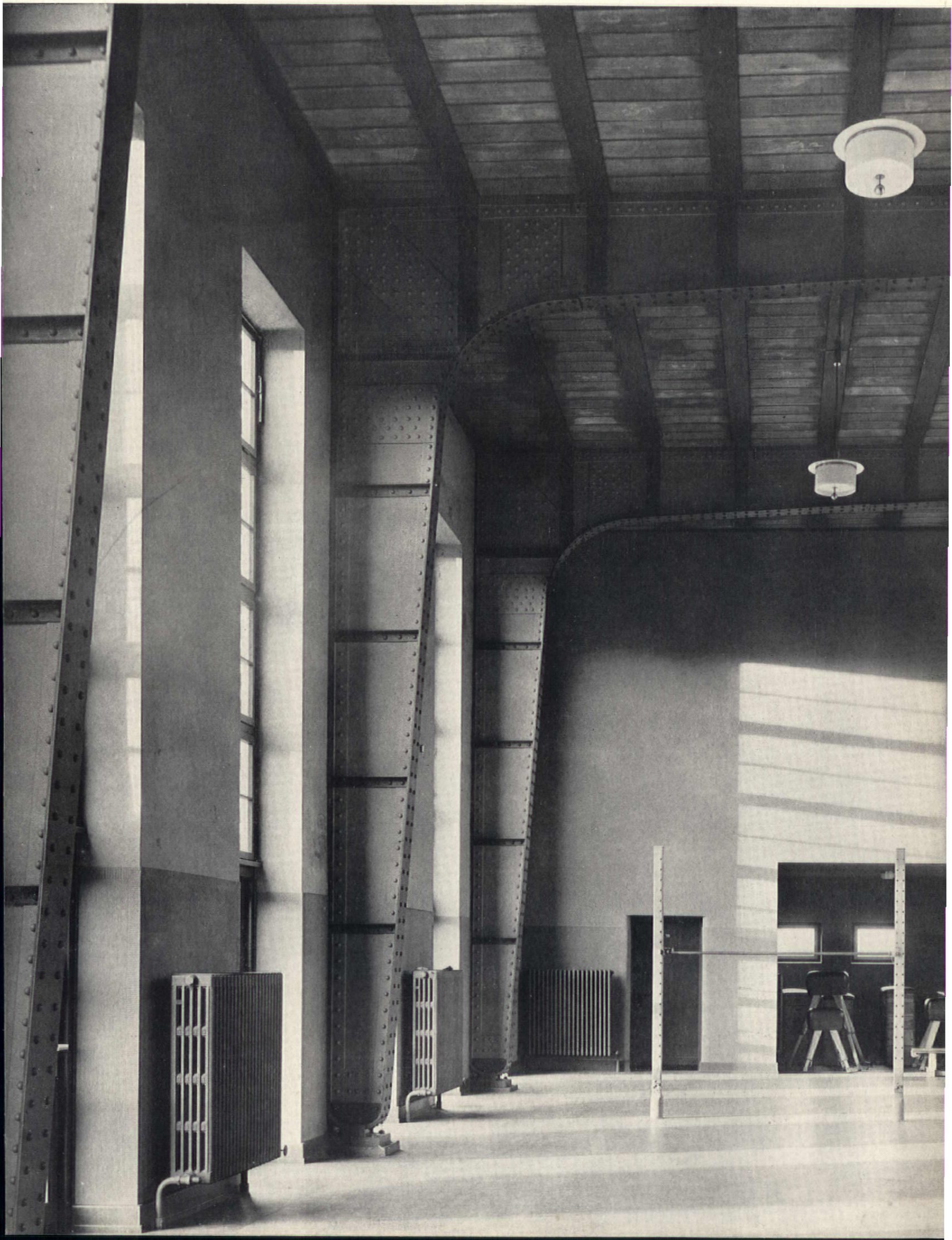
INTEGRATION OF TWO SEPARATE SCHOOLS

At the top of the plan is the parish or elementary school. At the bottom is the high school. Each is entirely separate in plan and equipment except that they share the assembly hall and a small gymnasium, between the two large ones and over the main entrance to the group. These schools are more like those of the U. S. in that they have classrooms on both sides of the corridor. Unlike American schools, however, each has a terrace to the south for outdoor instruction. The frank use of structural steel arches for decorative purposes is worthy of attention.

"Walddorfer" School near Hamburg

Fritz Schumacher, Architect



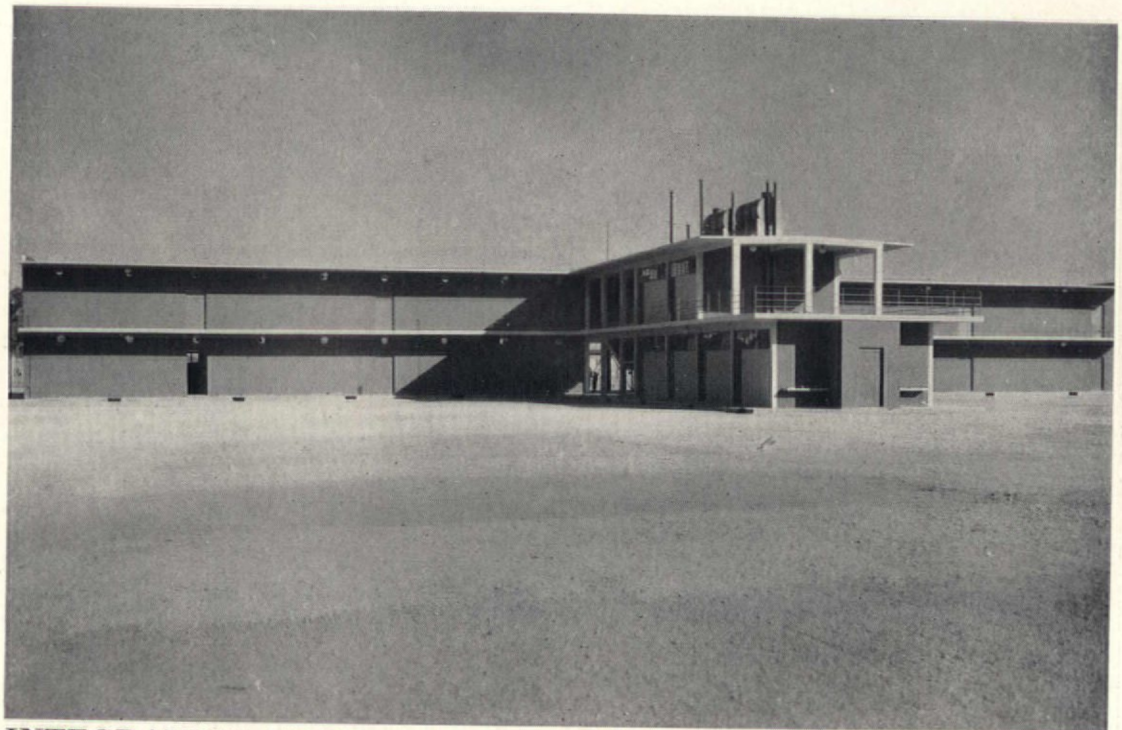


Sovfoto

INTEGRATION OF EDUCATION WITH INDUSTRY

The first communal building project of any new community is almost always a direct reflection of the fundamental point of view of its founders. Thus where religious belief is the issue this first building is usually a church. When politics is the burning question the product is apt to be a symbol of government. Russia's present industrial expansion depends upon the rapid technical education of a hitherto agrarian people. It is only to be expected therefore that in planning the community of 200,000 souls at Stalinsk, in Siberia, the first completed unit should be a polytechnic school. Around this nucleus the entire city and its industry will be built.

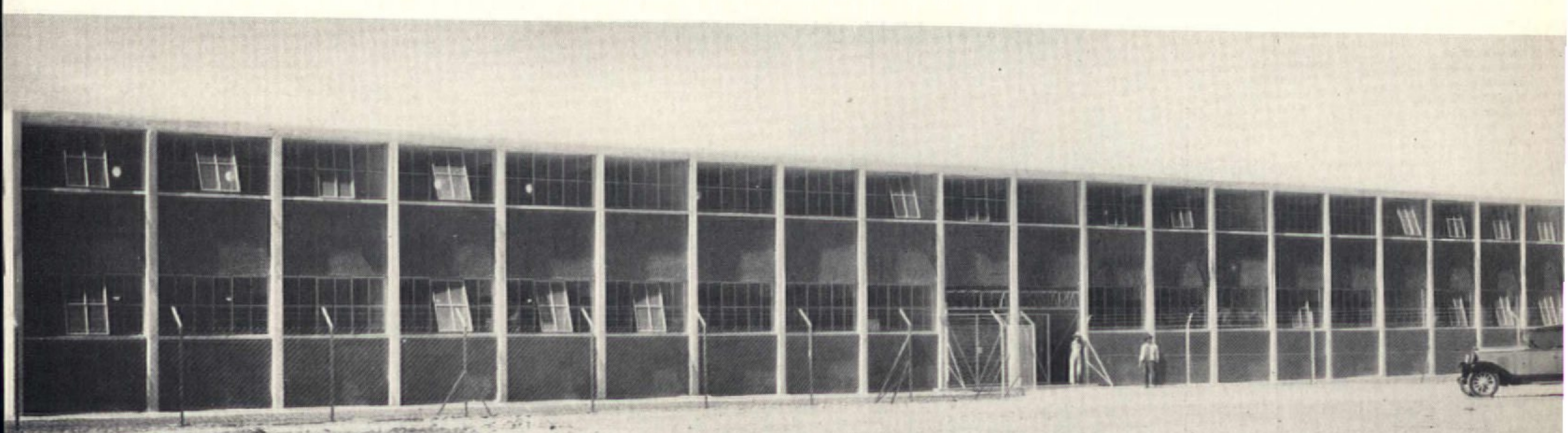
V. Shutte, Architect



INTEGRATION OF EDUCATION WITH ECONOMICS

Though education requires adequate buildings it does not necessarily require those buildings to be expensive. Here the school has been reduced to its simplest terms, a modular unit of plan and construction repeated any desired number of times. Completely functional, it disregards the esthetic, yet manages to achieve it. A comparatively poor country has been able to build an adequate number of these schools in a very short time and at minimum expense. This particular school cost, in 1932, $65,338.61 Mexican or about $20,000 in U. S. currency. Constant intense sunlight renders bilateral lighting unnecessary as well as often undesirable. The corridor is translated to a cantilevered balcony to save money.

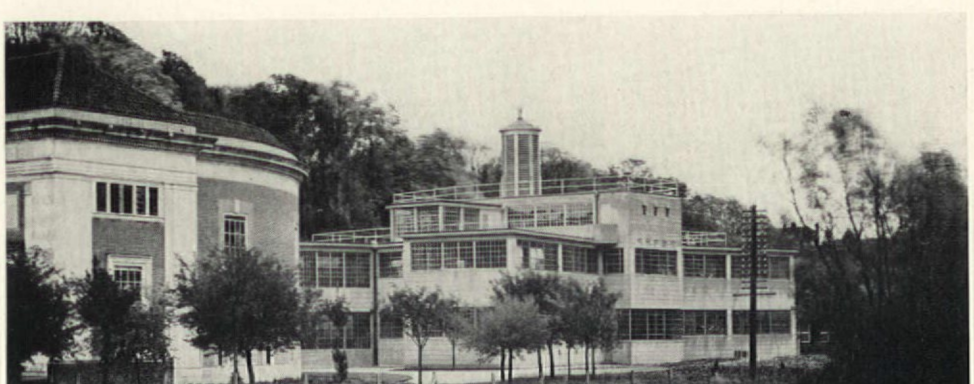
PRIMARY SCHOOL AT THE COLONY "PRO-HOGAR" JUAN O'GORMAN, ARCHITECT



EXPANSION OF EXISTING SCHOOLS

Modernization of schools does not have to be done all at once. Expansion of a plant should not, on the other hand, follow outmoded ways merely because the existing structures are of another day. Conservative England, more mindful of tradition than most other countries, recognizes this fact here, and has made the new technical wing of an old school in entire accord with the thought of today. The new part will be a standard to which to rebuild the old at some future time.

MARLBOROUGH SCHOOL — W. G. NEWTON, ARCHITECT



NEW TECHNIQUES

PLANNING

CONSTRUCTION

HEATING

AND

AIR CONDITIONING

LIGHTING

DECORATION

EQUIPMENT

Prepared with the assistance of Richard J. Neutra, Architect, George D. Butler, National Recreation Assn., Frederic A. Pawley, Alfred L. Jaros, and Alfred L. Baum, Heating Engineers, A. Warren Canney, Air Conditioning Engineer, Prof. Stanley L. McCandless, Yale University, Samuel G. Hibben, Electrical Engineer, Karl F. Staley, Electrical Engineer, M. Rea Paul, Color Specialist, R. A. Fife, Equipment Specialist, and others.

PLAYGROUND PLANNING

Recreational activities have not always been part of the U. S. school program. For many years U. S. pupils had to devote time not actually spent in study to helping their parents win the means of life itself. As higher standards of living came into being there was a corresponding lessening of this requirement and a growing concern with the use of time outside actual classroom hours. This necessarily brought about the introduction of organized recreational school activities. Today the prevalence of unemployment and the spread of child labor laws have laid increased emphasis upon the entire subject.

There are certain prime factors that must be considered at the inception of any plan for a school recreational development. The first is, of course, the matter of space. In urban centers, where playgrounds are most necessary, their planning has always been most difficult. In the past it has been customary to take a rule of thumb standard and say that approximately 25 sq. ft. per child should be allowed. Today the subject is being approached in a slightly more scientific way. Recently George D. Butler of the National Recreation Association consulted with Lee F. Hanmer and Clarence A. Perry of the Department of Recreation of the Russell Sage Foundation to determine some proper standards. Published in the fall of 1934 these may be taken as desirable minima from which to work. The requirements for an eight grade school of 600 pupils are reproduced herewith through the courtesy of National Recreation Association.

Facility and Area	Sq. Ft. Required		Child Capacity
Apparatus			
*Climbing tree	100		6
Slide	450		6
*Horizontal bars (3)	500		12
*Parazontal bars	600		12
*Horizontal ladders (2)	750		16
Traveling rings (stationary)	625		6
Giant stride	1,225		6
Small junglegym	180		10
Low slide	170		6
**Low swings (4)	600		4
**High swings (6)	1,500		6
Balance beam	100		4
See-Saws (3-4)	400		8
Junglegym (medium)	500		20
Total		7,700	122
Miscellaneous Equipment and Game Spaces			
**Open space for pre-school children	1,200		25
Open space for games of children 6-10	10,000		80
**Wading pool	3,000		40
**Handicraft and quiet game area	1,600		30
Outdoor theater	2,000		30
Building block platform	400		20
Sand boxes (2)	600		30
†Shelter house	2,500		30
Total		21,300	285
Special Areas for Games and Sports			
Soccer Field	36,000		22
Playground baseball (2)	38,125		40
Volley ball court	2,800		20
Basketball court	3,750		16
Jumping pits	1,200		12
‡Paddle tennis courts (2)	3,600		8
Handball courts (2)	2,100		8
Tether tennis courts (2)	800		4
Horseshoe courts (2)	1,200		8
‡Tennis courts (2)	13,200		8
‡Straightway track	7,200		10
Total		109,975	156
**Landscaping		6,000	
**Additional space for paths, circulation, etc.		7,000	
Grand Total		151,975 (3.49 acres)	563

* This apparatus — at least one of the units — might be omitted on playgrounds which are not to be used in connection with the school physical education program.

** These requirements may be considered as a minimum and on some playgrounds it will be advisable to allow more space or provide more facilities.

†The shelter house might be omitted where the essential facilities are otherwise provided.

‡One or both of these courts could be omitted where space is exceedingly difficult to acquire, but with a corresponding reduction in variety of service rendered.

It is obvious that much of the space scheduled in this table will be of little if any use to adults. Just what space should be added for adult recreation and how it should be disposed must be determined by a survey of the neighborhood. Groups of different racial inheritance have different predilections in sport. Italians are, for example, very fond of a bowling game which requires only narrow alleys while the English bowls require a much wider space. The former does not require turf, the latter does.

ADMINISTRATION

Another factor that governs the layout is the question of administration. In some cities, notably Detroit, Newark, and Milwaukee, the administrative machinery is quite elaborate and it is not so necessary for the architect to consider the problem of segregation of adults from children to the same extent as elsewhere. One thing that is apparently often neglected is the provision of proper locker and bath facilities for those outside the school. This may be taken care of in the school plan, but in larger plants the erection of a separate small building seems to be indicated.

In addition to expansion of the playground area some schools have adopted what is called the school-playground-park system. By this means the playgrounds of several schools might conceivably be planned as satellites of a larger park which would be used, not for actual games, but for nature study through the provision of such features as an Arboretum, Nature Trail (like the one at Auburn, N. Y.), an informal zoo, and properly landscaped aviary, fish ponds, etc. In this way nature study becomes vastly more efficient and the cost can be divided up among several schools.

This system also makes it considerably easier for schools to maintain an outdoor theater. A park is probably a much better place for it than the grounds of a single school. It could be made the center of all the community cultural activities and can also be provided with parking facilities that could not be taken from the school plot.

SURFACE

This emphasis on wider use of playground or recreational facilities has brought about a new interest in the surfaces of recreation areas. Turf is perhaps the ideal, but maintenance is almost impossible. The attempt usually ends in a mangy looking area which is neither grass nor sand. The greatest drawback to the ordinary forms of bare earth surface is the matter of dust, although this can be somewhat mitigated by the use of calcium chloride. These fields, however, take some time to dry out after a rain even when carefully drained through the sub-base.

Concrete has been used extensively, but is objected to by many on account of the very hasty abrasions that can be caused by a sliding fall. Asphaltic compounds of various sorts have been used in different parts of the country with various degrees of success. Chief objection to these is the fact that they get so hot in the sun. A few schools have recently adopted a surface of asphalt and cork that comes nearest to answering all objections. It is resilient, is not seriously abrasive, dries off immediately if properly graded, and does not get so hot as other bituminous compounds.

GYMNASIUM

The proper planning and equipment of the recreation field, playground or play space will do much to solve the problems of increasing demand, but there are other units in the recreational plant that need improvement. One is the gymnasium. If the adult part of the population is to be admitted to the gymnasium in any other capacity than as spectators, certain very definite problems arise. There are many good reasons why it may not be desirable for these adults to use the locker and shower rooms of the regular pupils. Space should therefore be provided for them which will not necessitate their passing through any part of the school proper. If the adults are to use the regular locker room facilities, entrance and exit must be so arranged that the locking of one or two doors will provide all essential separation.

When it comes to the matter of the adult as spectator, certain other definite problems arise. One is the often neglected provision of adequate check room and toilet facilities. Another is the matter of seating. The difficult compromise between the demands of floor space and those of seating space is now more or less resolved by the perfection of folding bleachers.

Another needed improvement in gymnasiums which are apt to be crowded by enthusiastic visitors is a consideration of the acoustics. Acoustical tile and plaster can dampen the din too often present. One problem of gymnasium maintenance is that of the lower part of the walls which are constantly in contact with sweaty hands and bodies. One solution is to use cork for this portion of the wall. This requires neither cleaning nor repainting and has the further advantage of a certain degree of resilience.

SWIMMING POOL

The same considerations of entrance and exit, toilet and check room facilities, and seating arrangements apply to the swimming pool which has, however, one problem of its own. That is in the matter of lighting. Waterproof fixtures have made underwater lighting of pools a practical feature and this should be provided in every pool whether used by people outside the school or not. One important thing to remember in this connection is to take advantage of the phenomenon of total reflection from the under side of the surface of the water. If this is done there will be not only no glare in a spectator's eye, but a very much increased efficiency of the underwater lighting itself.

To do this requires only some attention to the cone of dispersion of the rays of light from the reflector employed, and the location of the light sources sufficiently far below the surface of the water so that the edge rays may fall within the critical angle.

OTHER FACILITIES

A possible space for recreational activities that has been often neglected is the cafeteria. Here is a space free from columns or other spatial interruptions, that is used, assuming even a three platoon school, not more than three hours a day. The rest of the time this very large area stands largely idle. In a few of the more progressive schools, this cafeteria has been so planned that the necessary space before the counter takes on the nature of a corridor and then space that is devoted to the seating of the pupils is sufficiently separated so that it may be used for various other purposes. These other purposes have been, in different schools, for music, dancing and even physical education. The chief difficulty encountered in such use has been the disposition of many of the tables and chairs necessary to cafeteria use and unnecessary to any other. It has been suggested, though apparently not yet attempted, that these tables should be arranged something like the folding bleachers of the gymnasium.

The only drawback to this scheme has been that one side of the room at least is usually occupied by windows that render such tables impossible. The general adoption of air conditioning for such spaces, together with better methods of illumination, would make these windows unnecessary, and make some such folding arrangement practicable. In any case any good school architect should ponder the problem. There will be times when it may well be used in the evening for social suppers, but that does not modify the fundamental arrangement.

AUDITORIUM

It is safe to predict that the meaning of the word auditorium will change even more from its original sense than it already has. For a long time it has ceased to indicate an assembly place for merely audible instruction or entertainment. Projected images from slide and plate material, the ever-increasing educational use of the motion picture with color, sound or recorded explanation, and radio, have all been progressive steps toward more complete vicarious experience in fields not easily or economically approachable for a group in shop, laboratory or other activity room. Now, the use of television and the stereoscopic motion picture is imminent, waiting only for simplification and cost reduction of apparatus to become practical.

The original use of the school stage for lectures and performances, theatrical and/or musical, by school, community or visiting talent, will not be superseded by these mechanical aids, however economical the latter may become. This is true because of the natural attraction and plastic force of the human presence.

For economic reasons these presentations must usually take place before a larger group than the single class. According to one ideal theory, however, each classroom should have complete mechanical pedagogical equipment. For entertainment purposes a large audience is generally preferable. This reveals one argument for the educational theory of the smaller group, which is more easily kept intent upon its work. The trend toward informal classrooms is in opposition to such theater-classrooms, such machines for teaching, for general use, and thus, economically and theoretically, a larger room-instrument for the reception of audio-visual experience will continue to be a requirement of the modern school. The platoon system practically implies an auditorium as a convenient large capacity element.

All these uses of an auditorium necessarily require architectural provisions for equipment and architectural consideration of optimum conditions for hearing and seeing. Some of the more recent and less well-known factors will be found in check list form at the end of this article.

It is generally admitted that most school auditoriums are extremely bad for theatrical presentation. Shallow stages which are too high above the audience floor, which have insufficient height on stage and small or non-existent working areas offstage, are all too often found. Bad acoustics and uncomfortable sight lines in the auditorium itself are also too common.

There are two reasons, both economic, for unsatisfactory school stages: (1) Increased cubage; special construction and equipment boost first cost; (2) Municipal requirements often prohibit handling of scenery and electric equipment by unlicensed students, in this way raising operating expense.

When the theater is to be used by younger school children alone these are usually restrictions enough to justify the conventional plan, at some expense to the best development of the children. When, however, the auditorium is to be used, as it should be for the good of the community, in a progressive adult education program there is no excuse, except planning ignorance, for failure to provide ample and well-related working, presentation and viewing spaces. The experience of working in a theater group integrates and develops local practitioners and amateurs of all the arts. It can be the outstanding cultural force of a community and it can be made to pay its way. It takes more than architecture to do this, but architecture is required for full and continuing interest in this activity.

Economy has also suggested multiple-purpose use of the auditorium. A consideration of a number of school plans shows auditoriums which are planned to be used as gymnasiums, drill halls, and as occasional dance floors or spaces for highly educational teas or bridge parties. It is not detrimental to the form and func-

tion of an auditorium to expect such multiple uses as study hall, examination room or chapel, but the provision of proper sight lines for every seat, the designed sloping floor, and the economy of planned acoustics are too important to neglect. It is possible to use the stage alone for some of these other purposes when it is large enough and planned properly. Controlled daylighting on stage is important in such cases.

Where the budget permits, the ideal arrangement is to have separate rooms for the three more important and essentially dissimilar uses. This would indicate a completely equipped dramatic theater for three-dimensional plays, seating less than 1,000; a visual-education room for projection only, seating 125; and a large auditorium for lectures, convocations and graduating exercises, seating the entire student body, faculty and visitors. As in all other distinct problems of architectural design each one of these demands specialized knowledge, and sometimes the collaboration of several experts. One room cannot be expected to do well the different work of three.

CHECK LIST FOR PLANNING OF AUDITORIUM AND VISUAL EDUCATION ROOMS

Location. Centrally placed with respect to classrooms. Free from building for easy exits on several sides. Access from street for community use without opening rest of building. Parking space for public.

Quiet. This may soon mean "electrical silence" (for television) as well, and location with respect to electrical machinery for shops, elevators, if any, etc., may have to be considered.

General Equipment. Local fire ordinances control allowable materials.

Seats are 19 in., 20 in., 21 in., 22 in., 24 in. wide. Radii of seating rows should not be less than 20 ft. Space rows more than legal minimum of 32 in. back to back.

Provide controls for daylighting, if any.

Total exit widths controlled by number of seats by local law or Fire Underwriters' code. Panic bolts. Open out.

Standpipes, hose racks, extinguishers, glazed tool cabinets.

Clock. Signal systems.

Exit and emergency lighting.

Air Conditioning Systems. Upward distribution; downward distribution; ejector; plenum chamber with mushrooms; grilles; cooling tower.

Auditorium

Size. Should hold entire student body, faculty and some visitors. Usual maximum 1,500 seats, 8 sq. ft. per seat including aisles.

Shape. Governed by acoustics and sight lines for purpose intended. Normal human voice audible 75-100 ft. without amplification. General rule: length not more than three times width of room. Stadium plan recommended for easier supervision.

Sight Lines. Lines from side seats should not be outside 30° angles with perpendiculars to sides of motion picture screen. Sloped floor.

Platform. Conventional rostrum recommended only if auditorium is not to be used for play presentation. Plan platform for student processions.

See Visual Education Room for data on motion picture screens.

Typical High School Projection Booth. Two projectors, one stereopticon, one spot, rewind bench, emergency vents over machines. Vertical-sliding metal shutters over ports. Glazed if sound. Fan ventilation for booth; toilet for operator; booth fireproof, 13 x 9 x 8 ft.

Music. Space for piano, organ, radio. Orchestra pit doubtful value.

Services. Check room, box office, small storage room, lavatories and toilets.

Theater

Size. 300-1,000 seats.

Shape. Dictated entirely by acoustics and sight lines for three-dimensional presentations. Narrow, fan-shaped plan. Sloped floor. Replace rigid proscenium with adjustable frame. Consider adjustable ceiling splay over stage and fore-stage for control of acoustics.

Orchestra pit takes valuable space. Kills use of fore-stage. Consider other locations for music. Sixteen square feet per player.

Stage. Not more than 30-36 in. above audience floor.

Depth of small stage equals proscenium width, 25 ft. minimum.

Width of stage equals at least twice proscenium, one-half on each side.

Minimum height of stage house two to three times proscenium height (plus 3 ft. for blocks). Consider taking all scenery to one side on tracks overhead. Proscenium and proscenium wall often too high (bad acoustically). Pine floor on stage. Canvas pad or linoleum on acting area. Mechanically flexible stages (revolving, elevators, wagons) only for complete plants.

Whole stage trapped in sections with loose beams. Asbestos curtain, act curtain, tormentors, teaser.

Cyclorama. Plastered rear wall, solid, fixed in place or flying, stretched cloth, dome.

Counterweight system with at least one set of lines for every foot of stage depth.

Headroom for walkway above gridiron (5 ft.).

Backstage. Scene dock and property room. Typical size 20 x 30 x 18 ft. Fire doors. Dressing rooms: Consider use of locker rooms. Consider use of dressing rooms as practice rooms for music department. Wardrobe and makeup rooms. Connected with Home Economics Department.

Lighting. Working room all around switchboard. Locate board where stage operator may see. Light-bridge behind act curtain. Conventional numerous rows of border-lights no longer used. Proper angle of throw along diagonal of cube (McCandless). Ceiling or side wall outlets in auditorium very important. Balcony rail placed too low: casts shadows on background.

Air Conditioning. Ejector system suitable for small theater but requires careful design. High velocity discharge through nozzles on back wall. Exhaust through grilles at rear of orchestra seating.

Visual Education Room

Size. Seats 125.

Shape. Excellent sight lines must be provided. Keep seats within 20° angles with perpendiculars with sides of screen. No seats within 15 in. per 12 in. width of screen. Consider use of Schlanger reversed parabolic floor. Sloped and/or stepped floor.

Acoustics. Sound reproduction requires relatively great absorption. Provide this by full upholstery on seating, carpeting entire floor, and using various weights of drapes (to absorb different frequencies) as well as commercial acoustic products for wall and ceiling finish.

Screen. Conventional proportion 3 : 4. Two-foot black border or recessed mask to absorb spilled light.

Commercial types: Diffusive or matte; reflective or metallic; directive or beaded (best).

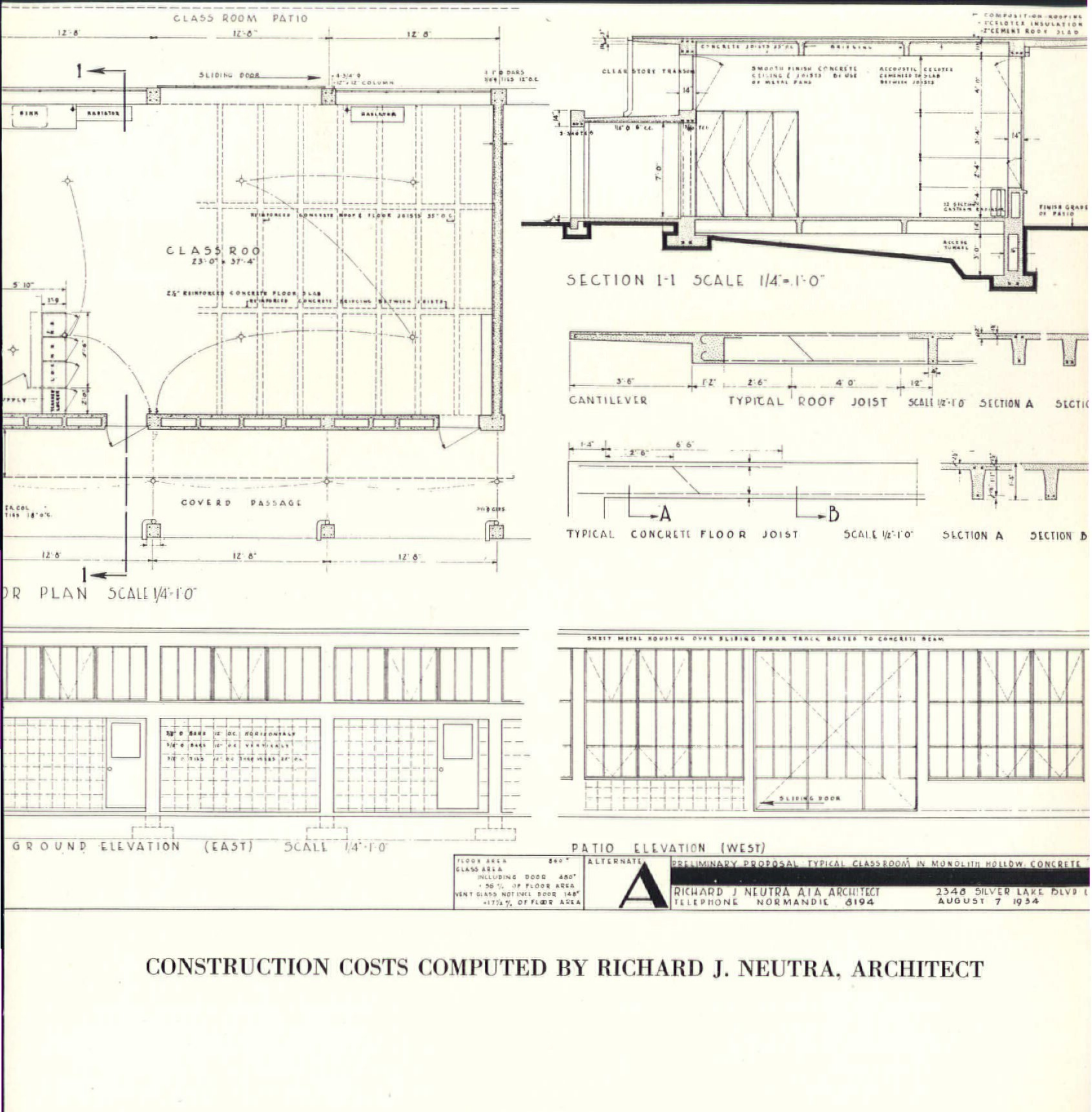
Least expensive: Heavy enameled duck on frame. Perforated type for sound horns placed behind not desirable for a small screen with seats relatively near.

Place horn below screen. If horns are to be behind screen they will require 3-4 ft.

Projection. Keep projection angle as near horizontal as possible without picking up standing persons. Eighteen degree maximum to avoid distortion.

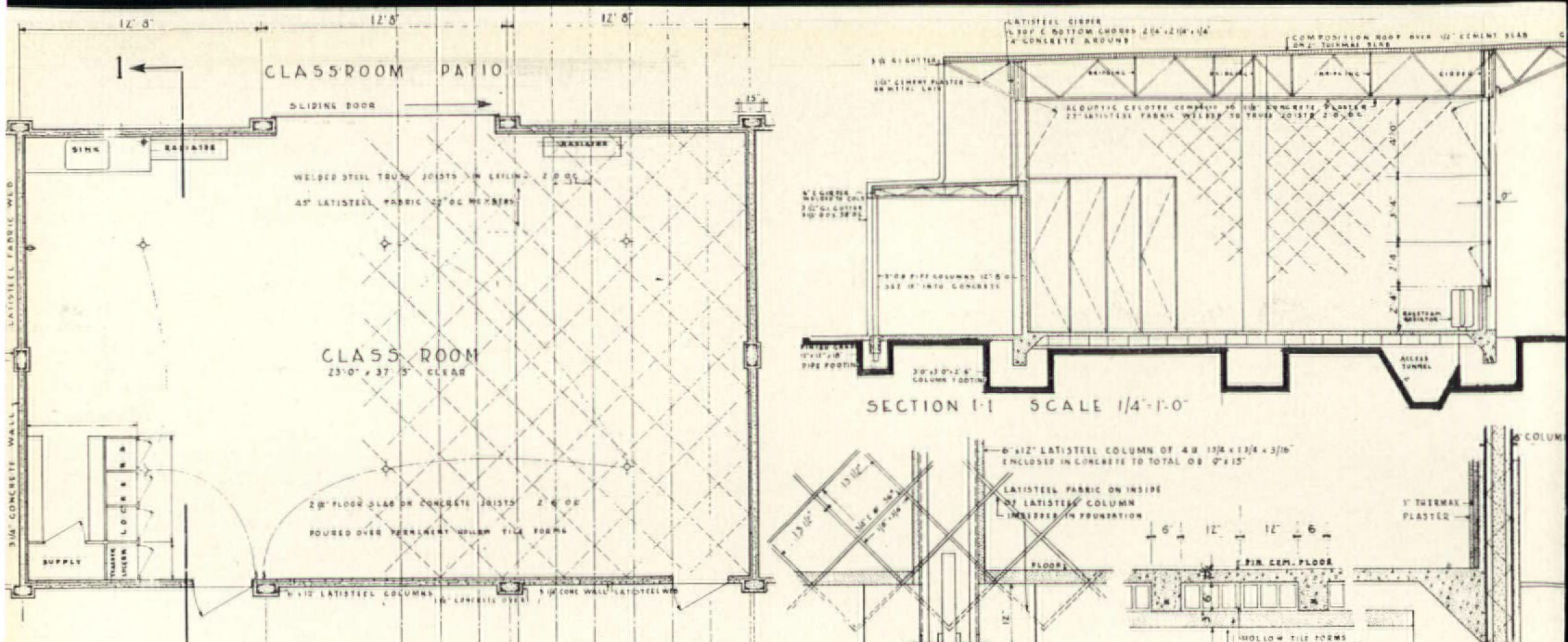
Small projection booth, 8 x 9 x 8 ft.

For further data see Bibliography, pages 36 to 44.



CONSTRUCTION COSTS COMPUTED BY RICHARD J. NEUTRA, ARCHITECT

This table of costs has been prepared by Architect Richard J. Neutra to show various possible construction systems for his projected school. The exact choice of many of the materials to be used will vary with different architects and different local conditions. All these costs have been computed on the basis of CWA wages. Architect's, engineer's and contractor's fees have not been included. Quotations are as of August-September 1934 and may fluctuate relatively.



CONSTRUCTION COSTS COMPUTED

1. Earthwork, Footings (Not Included Intermediate Supports of the Various Types of Raised Classroom Floors).

Alternate A 10.4 cu. yd. excavation, 280 cu. ft. concrete, 1,144 lbs. steel	$216.46
Alternate B 12.2 cu. yd. excavation, 330 cu. ft. concrete, 1,340 lbs. steel	250.85
Alternate C 12 cu. yd. excavation, 320 cu. ft. concrete, 1,320 lbs. steel	260.40
Woodframe structure 12 cu. yd. excavation, 320 cu. ft. concrete, 1,320 lbs. steel	260.40
Alternate D 8.4 cu. yd. excavation, 225 cu. ft. concrete, 924.1 lbs. steel	159.96

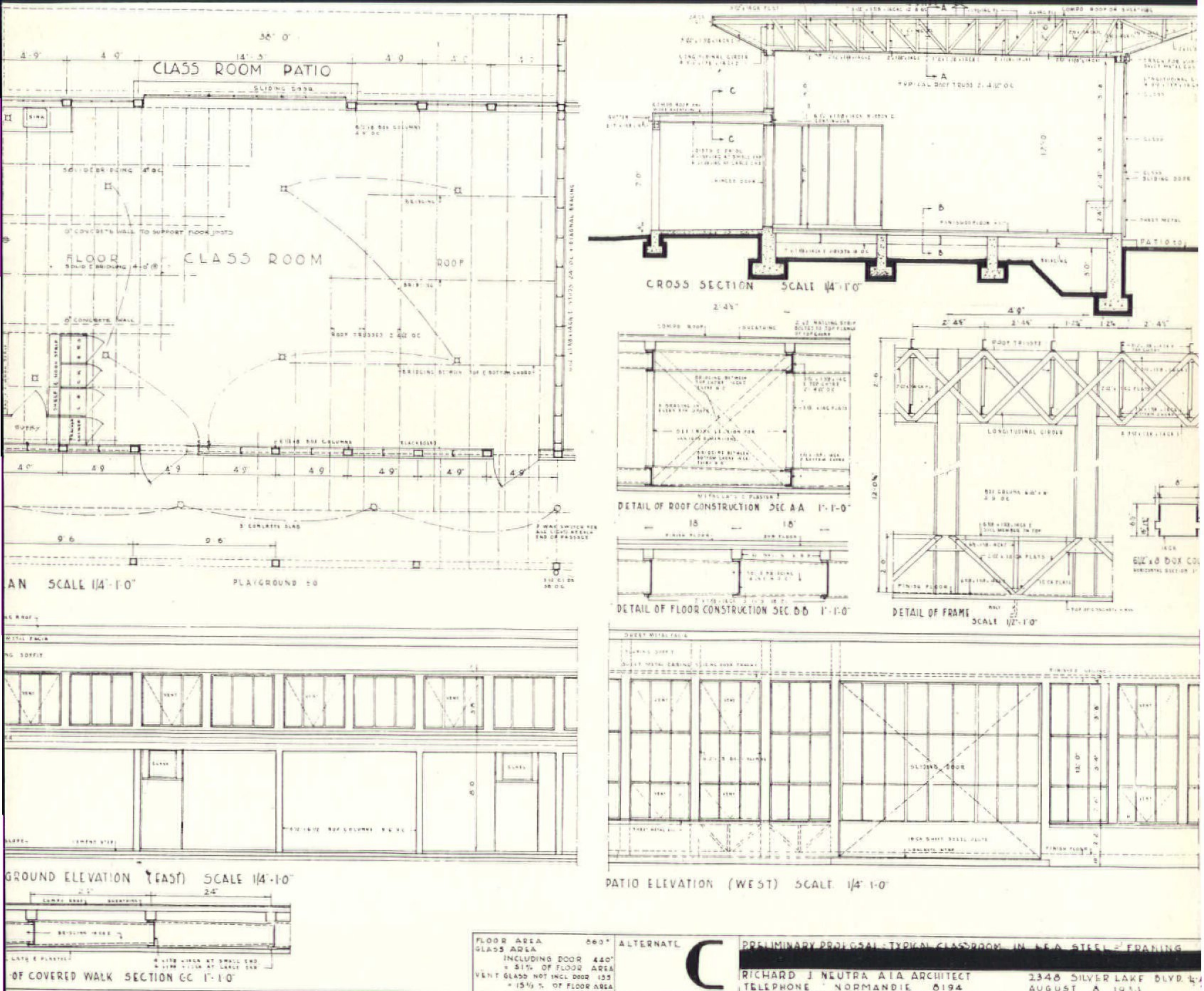
2. Corridor Flatwork On Ground

Four inch concrete with integral top finish 6 x 6 in. 10-gauge reenforcing. 285 sq. ft.	51.30

3. Ground Floor Construction And Its Intermediate Supports—Without Finish Flooring.

Reenforced concrete rib-floor on metal pan forms (as illustrated on alternate A)

Excavation, 72 cu. yds	$90.00
Concrete, 354 cu. ft	141.00
Steel	117.00
Total	$348.00



BY RICHARD J. NEUTRA, ARCHITECT

Reenforced concrete rib floor on hollow tile forms on ground (as illustrated on Alternate B)

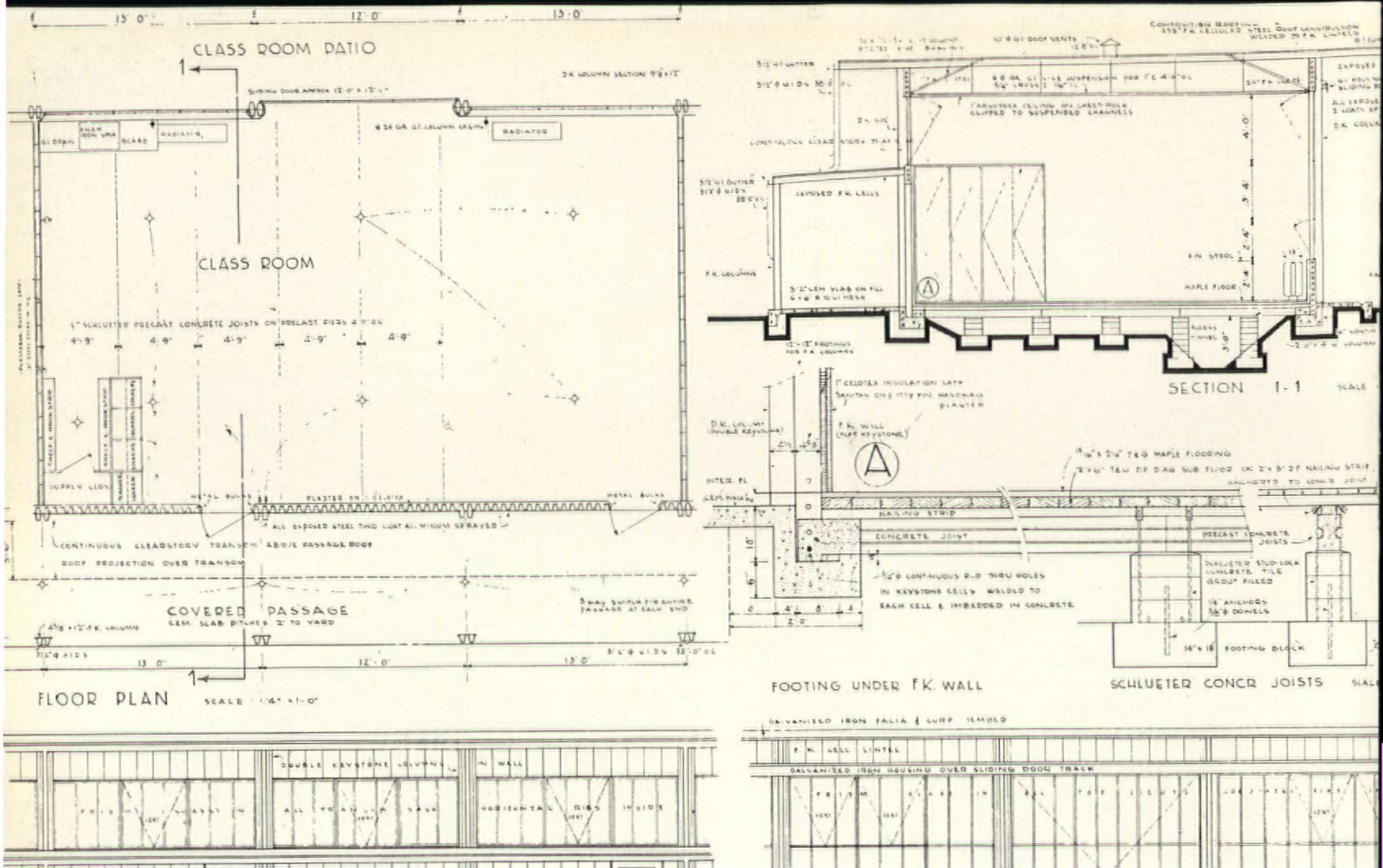
Excavation, 27 cu. yds.	$33.75
3 in. waterproof oiled sand bedding	36.00
Hollow tile floor forms, installed	70.00
Carpentry formwork over plumbing trench, 170 ft	25.50
Concrete (reenforced), 270 cu. ft	146.24
Total	$311.49

Wood subfloor on galvanized sheet steel joists borne by concrete walls (as illustrated on Alternate C)

Excavation, 48 cu. ft	$60.00
Concrete walls, 100 cu. ft	40.00
Steel floor joists and bracing installed	226.00
Nailing strips and rough floor	79.00
Total	$405.00

Prefabricated vibro concrete joists (as illustrated on alternate D)

Excavation, 42 cu. yds.	$53.00
Concrete tile piers, concrete joists incidental steel installed	96.30
Nailing strips 2 x 6 in. No. 2 T&G sub-floor installed	87.70
Total	$237.00



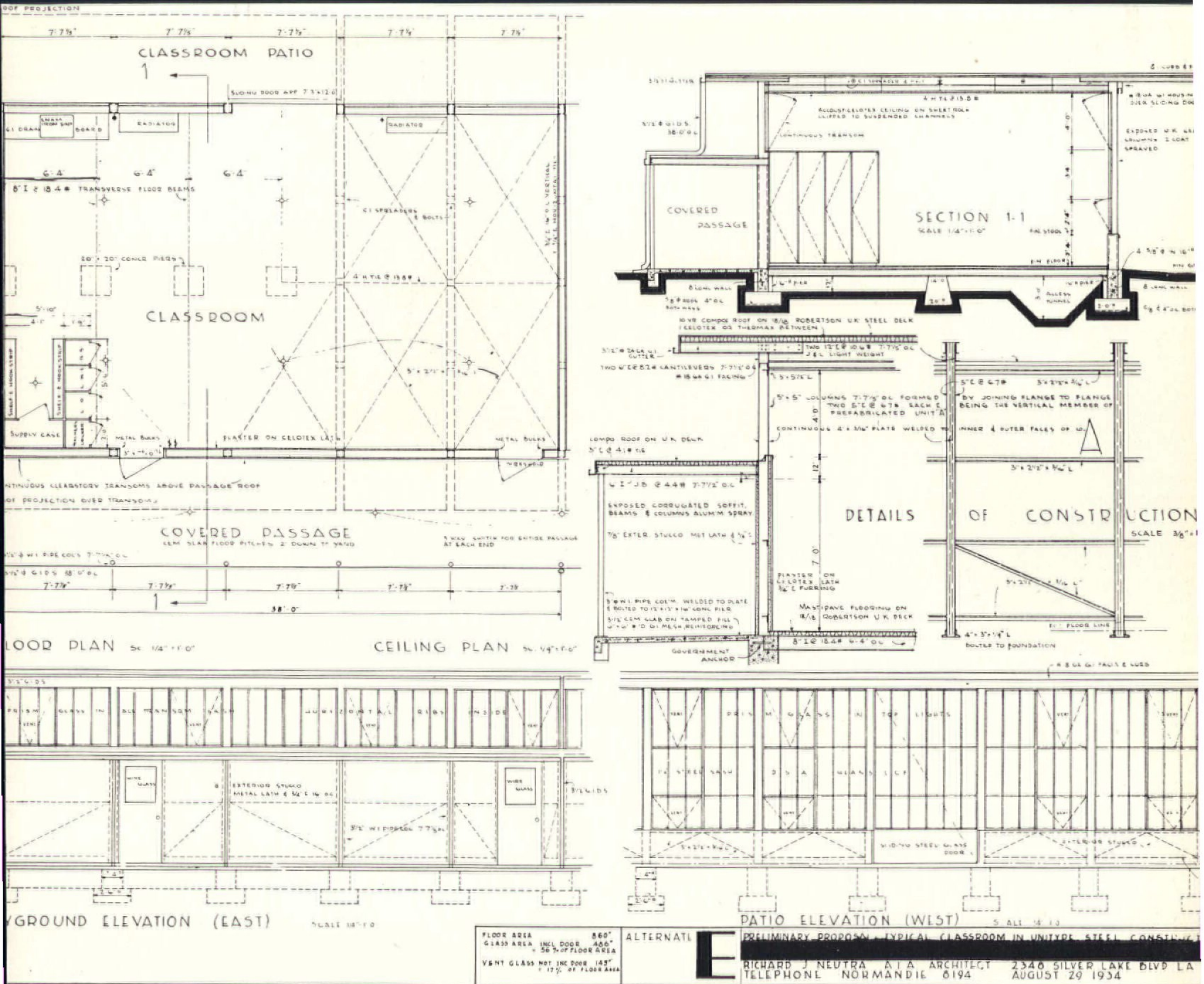
CONSTRUCTION COSTS COMPUTED

4. Superstructure Including Roof Overhang and Covered Walk Construction Insulated, Sheathed, Furred, Lathed and Plastered Exterior and Interior As and Where Specified.

Reenforced concrete (as illustrated on alternate "A")	$1,700.00
Latticed steel construction with hand applied cement and Thermax roof sheathing. (No installation lining on exterior walls, otherwise as illustrated on alternate "B 1.")	$1,949.00
Latticed steel construction as above, but with airgun applied cement (as illustrated on alternate "B 2.")	2,099.00
Light galvanized steel frame with wooden roof sheathing (as illustrated on alternate "C.")	2,012.00
Light steel construction of insulation lined Robertson "Keystone" elements for exterior walls, bearing piers and roof and of metal stud construction for cross walls	2,275.00

5. Finished Flooring Installed.

1/8 in. Acco tile on asphalt emulsion	$139.50
Battleship linoleum grade "A" gray on felt	150.00
Mastipave on asphalt emulsion	136.00
Floorhide art gum flooring	129.00
13/16 Maple, first grade, stained, filled and polished	165.00
13/16 Maple, second grade, stained, filled and polished	150.00



BY RICHARD J. NEUTRA, ARCHITECT

6. Acoustical Ceiling Treatment.

630 sq. ft. of B Acoustic Celotex installed coef. .47	$187.00
860 sq. ft. of A Acoustic Celotex installed coef. ,36	172.00
Top coat of approved acoustic plaster ½ in., troweled coef. .35	63.70
860 sq. ft. of Absorbex "C" coef. .33	83.52

7. Sash. Fixed and Ventable.

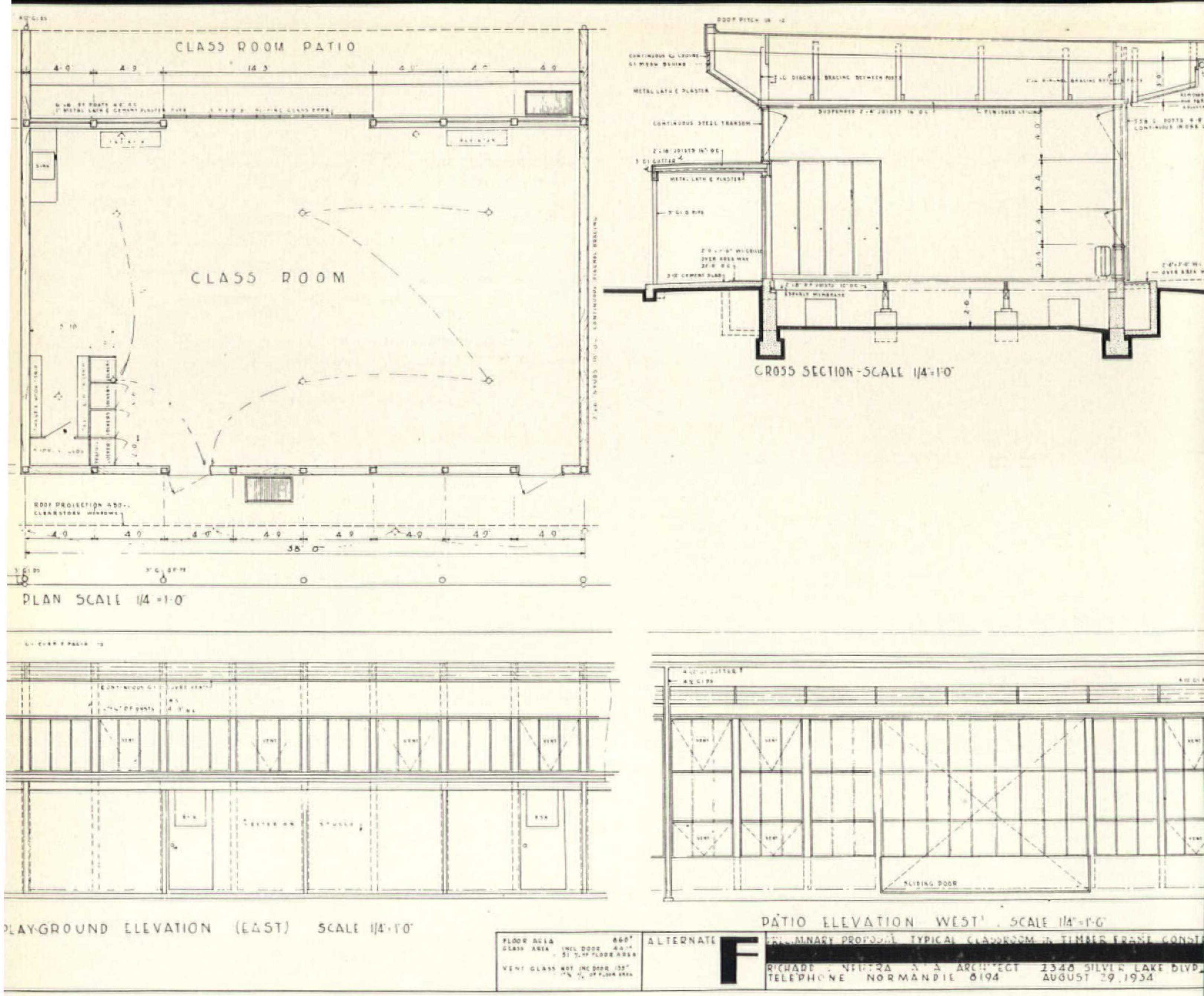
Steel sash of division as indicated of 1¼ in. double contact sections upper vent leaves with chain operators, bronze hardware erected	$278.00
Sugar Pine sash, Oregon Pine frames, Donovan hardware ...	164.26

8. Sliding Steel Door.

Track and hangers, solid frame of steel sections spaced like sash muntins, floor bolts, bronze door handles, weather stripped, installed	$102.00
Second quotation	160.00
Third quotation	160.00

9. Glazing.

All sash and sliding door double strength "A"	$105.00
Second quotation	121.00
Third quotation	125.00



CONSTRUCTION COSTS COMPUTED BY RICHARD J. NEUTRA, ARCHITECT

10. Electric Wiring.

Full conduit work	$45.00
Second quotation	77.00
Fixtures, six semi-indirect	72.00

11. Plumbing.

Supply, waste vent and sink	$75.00

12. Heating.

Gas steam radiators, as in existing main building	$110.00
Second quotation	140.00

13. Sheet Metal.

Gutters, downspouts, fascias, roof vents, lining of sink table	$85.00

14. Finish Carpentry and Mill Work.

Closets, shelving, room doors	$115.00

15. Finish Hardware.

Bronze Hardware for room and CC doors, not including window hardware	$65.00

16. Painting.

As specified	$120.00

17. Blackboard	$35.00

Combined *maximum* total $4,427.70. Combined *minimum* total $3,601.36.

HEATING AND AIR CONDITIONING

EIGHT years ago the American Public Health Association and the American Society of Heating and Ventilating Engineers reached a complete deadlock of opinion on school heating and ventilating. That deadlock still exists. The Association, because of pleas of teachers, officially advocated the use of open window ventilation. The Society, in substance, recommended closed windows and mechanical ventilation.

Since then it has apparently been impossible to reconcile the two theories. The fact seems to be that there were both right and wrong in the viewpoint of each body. In certain parts of the country, and in certain rooms, windows should be opened as wide as possible. In many sections of the United States due to air pollution, it is impossible to maintain proper conditions, if the windows are to be opened from time to time. The best solution therefore is to solve each of these problems as entirely separate cases. In the majority of cases, complete air conditioning will be the answer. In the remainder, where special conditions call for a considerable number of rooms with open windows, the solution will be to use "panel heating" for these rooms and air conditioning for the remainder.

Before discussing the more important subject of air conditioning it will be well to explain just what is meant by "panel heating." It is a system of heating based upon the use of radiant heat rather than upon heating the whole body of air within the room. It has been used successfully abroad, particularly in Great Britain. There it takes the form of continuous pipe coils embedded in the plaster of the ceiling. Hot water circulates through these. In other parts of Europe large flat castiron radiators are used which are fastened to the ceiling.

The method of figuring this heating is extremely complicated and should be undertaken only by a competent engineer. In general it is based upon the assumption that the human body is a cylindrical radiator of a certain size and heat radiating capacity which can be maintained in equilibrium by receiving radiant heat from other sources at the same rate. The basic calculations of Professor Barker of England have been reduced to a series of tables which are used to determine these rates.

This radiant heat warms the body without raising the temperature of the whole body of air to the same degree, and permits of perfect bodily comfort in air temperatures considerably less than the conventional 70° F. It is obvious that this system will not operate properly in the presence of strong air currents and that there are more or less definite limitations upon the temperature of the outside air. Its first cost is apt to be high, while the operation costs are low.

The vast majority of the spaces in school buildings will, however, be unsuited to this type of heating and should therefore be equipped for air conditioning of the most modern and complete type. It is impossible to say what the additional first cost of such a system may be, but it is probable that it is worth whatever it may cost in saving of health and improved educational results.

Air conditioning today is an exact science. All the experimentation and groundwork have been done. The basic data were worked out 30 years ago and research since that time has found very little to add. The fundamental physiological data have been known for at least eight years. The technique of conditioning has been in use for the last four years. Except for mass production, unit air conditioners with or without self-contained refrigeration, and several commercially practical refrigeration machines, no radically new equipment or method has appeared in recent years.

All this means that the architect may approach the question of air conditioning for schools with the assurance that he is not being asked to experiment. All he has to do is to accept aid from throughly trained and experienced technicians. From these he should ask for a system that:

1. Establishes temperature and relative humidity within suitably narrow toleration limits within the occupied zone of each space conditioned.
2. Establishes simultaneously with the above, and also within predetermined limits, the rate of air motion and its direction. Both of these should be controlled without draft or stagnation at any point in the occupied zones.
3. Establishes a requisite degree of air purity on a specified maximum dust count basis.
4. Provides replenishment with a predetermined minimum quantity of outdoor air to sustain a wholesome atmosphere.
5. Purges haze from smoking and other sources.
6. Prevents the detectable concentration of odor vapor.
7. Accomplishes items 1 and 2 uniformly in the same space and in adjacent spaces regardless of difference in local conditions in the different spaces.
8. Scientifically controls sounds generated by the operations of any of the equipment.
9. Provides means for a sliding scale relation between indoor and outdoor conditions.
10. Provides instruments and means for foolproof operation, cost control and the recording and supervision of results produced.
11. Provides adequate accessibility for proper maintenance and quick repairs.
12. Properly coordinates with the general architectural scheme.
13. Properly coordinates with the other mechanical services to assure adequate operation with a minimum staff.
14. Properly coordinates with the other mechanical services in an economic sense, so that electrical and plumbing costs rightly chargeable are included in the budget of air conditioning.
15. Establishes total ownership cost at a minimum, by location, selection, and arrangement of equipment, pumping methods, etc., without sacrifice of any item herein.
16. Maintains a known initial and operating cost in economic balance with the building cost.

This is not, however, all. There are a number of other advantages to proper air conditioning which the architect should be aware of and stress in the presentation of the whole subject to the school board. These have nothing to do with health of the teacher or pupil, but with the economics of maintenance of the fabric of the structure itself. Thus where there is a complete air conditioning system:

1. Annual redecorating costs are considerably reduced.
2. Routine cleaning costs are appreciably less.
3. Sudden expansion and contraction due to fluctuating differentials between indoor and outdoor surface temperatures are eliminated.
4. The cracking of plaster is virtually abolished.
5. All hygroscopic materials, such as leather, paper, woodwork, glued joints, and certain types of finishes are preserved for many years beyond their normal life under ordinary conditions.
6. Office material and desks stay fresher and cleaner throughout the day.
7. Heating costs are materially reduced in several ways:
   a. By the maintenance of a lower average temperature.
   b. By reduction of cold air leakage inward and warm air leakage outward through windows.
   c. By reduction or elimination of the loss of radiant heat to cold window surfaces.
8. The possibility of keeping windows tightly locked tends to prevent thieving.
9. Operating costs ordinarily charged to ventilation are entirely absorbed.
10. In many cases the unit cost of steam and electricity may be reduced. The changed load factor permits the purchase of additional steam or electricity in the lower rate brackets. In one recorded installation refrigeration was thus obtained for virtually nothing.
11. Sealed windows tend to prevent the possible spread of fire. This may often result in lower insurance rates.

12. In many cases the economic return from the school plant could be materially increased by cooling air so that the plant might function at maximum efficiency throughout the entire year. This would particularly apply to the auditoriums.

Assuming that it will be possible for the school architect to convince educators and school boards, who will probably not need convincing except upon the score of economy, that new schools should be air conditioned throughout, what are the implications for the architect himself? Some of the more obvious are:

1. Enormously increased flexibility of planning. The conventional shallow center corridor plan need no longer be rigidly adhered to. Greater compactness of structure becomes possible.

2. Many spaces may be considered as windowless where the window has no significance except the traditional one of ventilation.

3. More efficient routing due to the possibility of ready interchanging of different types of spaces without regard to the shape hitherto imposed by the necessity of window ventilation.

4. In certain types of spaces a more efficient seating arrangement no longer dependent upon windows which, being present in accordance with ventilating requirements, are also considered as sources of illumination.

5. A 25 per cent increase in wall space becomes available in many rooms with a corresponding increase in their possible usefulness.

6. Greater stress upon planning for community use of the school plant due to the possibility of summer use. While the detail of ways and means of air conditioning school buildings is best left to the engineer, it should be noted that there are three basic methods that may be used:

1. A complete centrally located plant with distributing ducts.

2. A combination system which has central apparatus plant plus some unit equipment operative in and controllable from each separate space.

3. A unit type system which may have self-contained refrigeration if desired. Basic requirements of the centrally located system are:

1. Large apparatus room in which should be confined all heating and/or mixing of water steam, etc.

2. An increase in floor heights of from 1 ft. to 1 ft.-6 in. For auditoriums and other special cases the increase would be greater.

3. The provision of adequate space for vertical shafts for ducts preferably at intervals from the basement.

9. Excavation will usually be necessary for the apparatus room. Corridor headrooms must be closely watched as this is the most desirable space for running large trunk ducts.

It should be noted that where operating economies can be obtained there may be several separate and entirely independent central stations. It is even possible to have one on each floor in multi-story buildings. Basic requirements of the combination system are much the same as those for the centrally located system. An additional requirement is the provision adjacent to the space to be conditioned of room for either a small fan or a small heater dependent upon the design of the system.

The unit system must make use only of units which are equipped with a good humidifier with room hygrostatic control. These units will have great usefulness in supplementing existing classroom equipment if the legal requirement of 30 cu. ft. of new outdoor air per pupil per min. is relaxed.

This legal modification would also make it possible to increase the usefulness of existing plants in summer weather in certain portions of the U. S.

In conclusion it should be pointed out that it is the consensus of opinion that any reform in school planning and equipment practice must come in the first instance from the architect. (See pages 17 to 20). It is therefore the architect's duty to become sufficiently informed on this question of air conditioning to be able to plan intelligently with the aid of this new instrument as well as to present intelligently to legislative bodies and school officials the reasons for demanded changes in existing codes of heating and ventilation.

LIGHTING STANDARDS AND EQUIPMENT

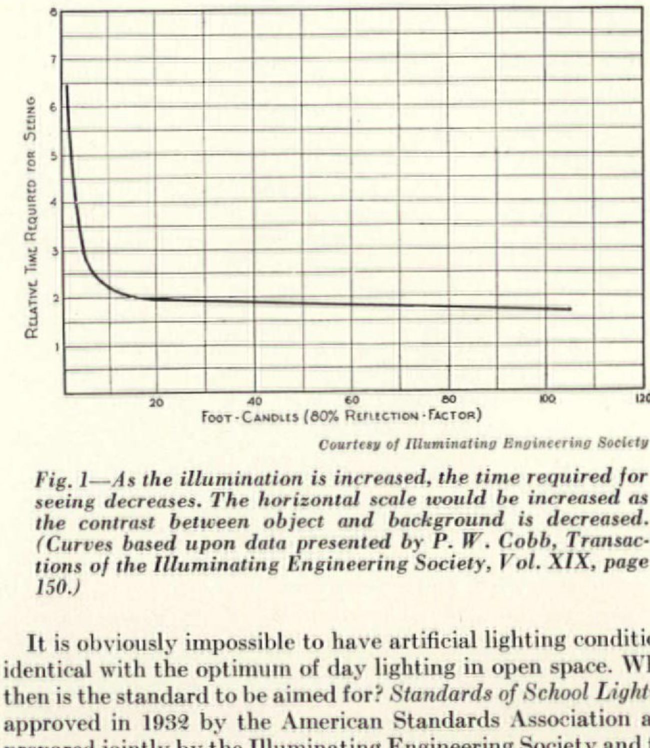
FIVE million U. S. schoolchildren — one out of every five — have defective vision.

Throughout the land, schools have been installing "sight-saving" classrooms, yet a survey of these showed that 185 out of 232 (79%) had lighting intensities below a minimum set by the Illuminating Engineering Society and the A.I.A. And that minimum was approximately 33⅓ per cent of what it should have been.

Such facts as these emerge startlingly from any adequate bibliography or survey on lighting. Experts agree that the best possible light is that in the shade of a tree at noon on a clear June day. What are the characteristics of this illumination? It is evenly distributed, with no glare and no bright source visible. It has an intensity of more than 500 foot-candles.[1]

What is the lighting of the average public school classroom in the U. S.? During the period of full daylight it is one-sided at best and often glaring. Its intensity is usually not more than 50 foot-candles (often less) at the plane of the window and falls off rapidly toward the side of the room opposite the window.

As daylight fades, or during evening sessions, artificial light comes into use. What is this light like? It frequently emanates from two to six small sources, unevenly distributed, glaring, and often with dazzlingly bright sources in the field of vision. And its intensity on the desk averages only 2 to 3 foot-candles, or the equivalent light of *two or three candles on each desk.*



Courtesy of Illuminating Engineering Society

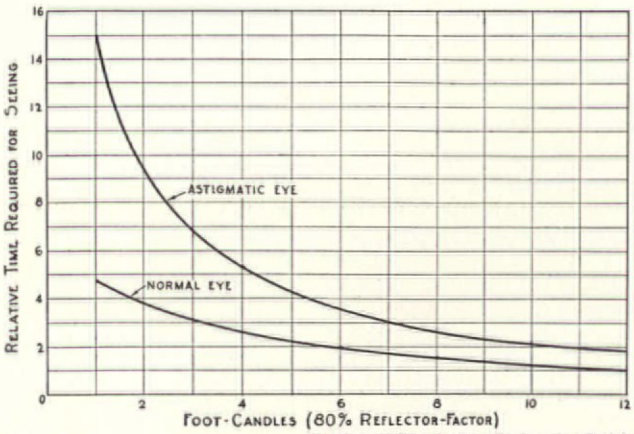
Fig. 1—As the illumination is increased, the time required for seeing decreases. The horizontal scale would be increased as the contrast between object and background is decreased. (Curves based upon data presented by P. W. Cobb, Transactions of the Illuminating Engineering Society, Vol. XIX, page 150.)

It is obviously impossible to have artificial lighting conditions identical with the optimum of day lighting in open space. What then is the standard to be aimed for? *Standards of School Lighting* approved in 1932 by the American Standards Association and prepared jointly by the Illuminating Engineering Society and the American Institute of Architects suggest a classroom intensity for pupils of normal vision of from 8 to 12 foot-candles. Although this is four times the average present intensities it is still not enough. Even so it is so much better than the average practice that it probably represents the highest objective possible today.

Figure 1 shows the relation between time of seeing which we shall call "perception time," and intensity of illumination. This shows that 15 to 20 foot-candles is the minimum intensity for

[1]Foot-candle is the unit of measurement of illumination intensity. It is the amount of light thrown upon a surface by a standard candle at a distance of one foot.

normal speed of perception. At the actual average of 2 to 3 foot-candles the perception time is three times that norm. At the recommended intensity of 8 to 12 foot-candles it is only a little slower than is desirable.

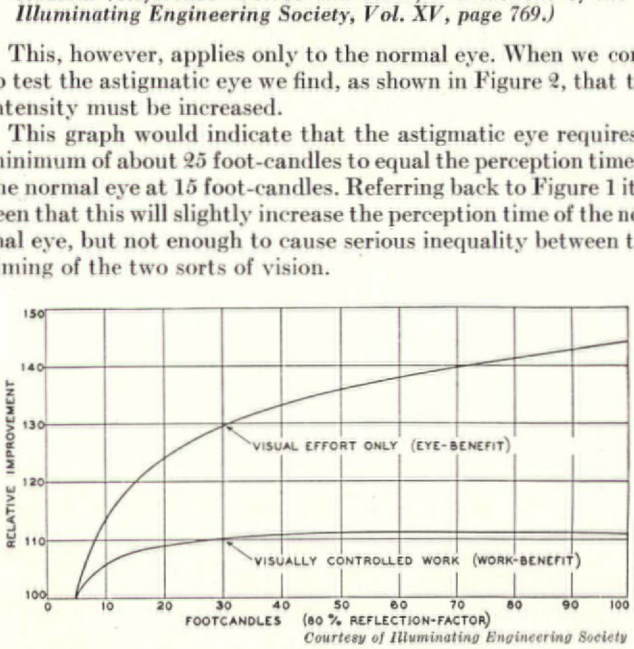


Courtesy of Illuminating Engineering Society

Fig. 2—As the illumination is increased, the handicap of astigmatism becomes less. The horizontal scale would be increased as the contrast between object and background is decreased. (Reference—Ferree and Rand, Transactions of the Illuminating Engineering Society, Vol. XV, page 769.)

This, however, applies only to the normal eye. When we come to test the astigmatic eye we find, as shown in Figure 2, that the intensity must be increased.

This graph would indicate that the astigmatic eye requires a minimum of about 25 foot-candles to equal the perception time of the normal eye at 15 foot-candles. Referring back to Figure 1 it is seen that this will slightly increase the perception time of the normal eye, but not enough to cause serious inequality between the timing of the two sorts of vision.



Courtesy of Illuminating Engineering Society

Fig. 3—A summary of tests on the ease of seeing, in direct comparison with a summary of several tests on speed and accuracy of seeing. The "Eye-benefit" curve summarizes the results of several experiments involving simple visual recognition of test-objects. The "work-benefit" curve summarizes the results of several experiments involving the performance of various tasks guided by vision. The horizontal scale would be increased as the contrast between object and background is decreased. (Reference—"Seeing" by Luckiesh and Moss, 1931, page 169, Williams & Wilkins Co.)

So far we have discussed vision without regard to the performance of any task depending upon it. Reference to Figure 3 will show that these minima must be still further increased if the maximum "work benefit" is to be obtained. This chart shows that this "work benefit" attains an effective value at 30 foot-candles. Since this is for the normal eye it must be increased to something between 45 and 55 foot-candles to take care of the astigmatic eye.

This then is the minimum intensity for which, other things being equal, we should strive. It is approximately the average intensity of the properly daylit room under optimum conditions.

[2] Å is the symbol for Ångström unit. This is the unit of measurement of the wave lengths of light. It is equal to 1/10,000 of a micron or 1/100,000,000 of a centimetre.

To arrive at a minimum intensity is not, however, enough. There remain for consideration questions of glare, distribution, and color. It is obvious that if the intensity of illumination is stepped up to something over twenty times the present average, direct lighting sources will produce an almost intolerable glare. This may furthermore be accompanied by very uneven distribution. The size of enclosing globes necessary to reduce glare to proper limits would render their cost prohibitive if indeed they could be produced at all.

The ideal solution would be some form of totally indirect lighting that could be concentrated in a few sources of great intensity set well above the eye level and behind or to one side of the pupils' desks. This would produce lighting properly directional and diffused, approximating day-time condition. As there is no known technique for doing this successfully the best compromise is to use either a combination of totally indirect and totally direct sources, or so-called semi-indirect luminaires. This may well be supplemented for special purposes by some sort of separate direct blackboard lighting controlled by prismatic lenses from above. It is hardly necessary to say that with intensities of this order it will be imperative to eliminate all possibility of specular reflection from desks, blackboards, and all other equipment. This should extend to such apparently trivial details as the finish of typewriters, their keys, and those of calculating machines in classrooms devoted to such subjects as stenography or bookkeeping.

Having touched upon intensities, glare, and distribution there remains the question of color. Research has indicated that the optimum color for scientifically accurate vision is reached at about 5800Å, equivalent to the green-yellow part of the spectrum.[2] This is, however, a rather trying light under ordinary circumstances as it distorts the natural balance of color. There are uses for this color however and for various others that recommend themselves for certain special uses. Thus a combination of incandescent and mercury vapor lamps is indicated where work is to be done in which an apparently white light is desirable. Other combinations of gaseous sources may be adjusted to produce an approximation of daylight which is almost 95 per cent correct (there are a few gaps in the red and orange red end of the spectrum). Sodium vapor lamps with their monochromatic yellow color are particularly valuable where extremely rapid perception is desired or where metals are examined for faults. Mercury vapor lamps alone are suggested for fine manual operations like engraving. Final decision as to the proper color of light for a particular use is of course the province of ophthalmologist and illuminating engineer, but the architect should understand the general principles.

All this raises, of course, the question of cost. It is very difficult to design indirect lighting equipment that does not require 30 to 40 per cent more energy than would be required by a direct source. Gaseous vapor sources of light, however, have almost twice the efficiency of the present day tungsten filament lamp. These are various and comprise sodium vapor, neon gas, mercury vapor, etc. By such double efficiencies light intensities equal to that of the tungsten filament lamp can be obtained with one-half the current consumption. In other words the current usually used today can produce double today's intensities.

This question of cost may also be taken care of, to some extent, by using what are known as "three light" sources. These are so designed that three different intensities may be produced from the same lamp. Will these higher levels of illumination, better quality, and distribution pay their way? If the object of a school is to educate the answer is "yes."

An experiment made over a three year period in one of the schools in Tuscumbia, Alabama, provides an example. Two exactly similar classrooms and two classes as nearly similar as possible were taken as the basis of this experiment. In Classroom A there were two 150 watt ceiling type direct sources controlled by a wall switch. In Classroom B were installed four 300 watt totally indirect fixtures controlled by a photo-electric switch. In room A the amount of light was, at night, 2 foot-candles on the row of desks nearest the walls and 6 foot-candles on those in the center of the room. In room B the amount, at the same period,

was from 12 to 14 foot-candles on the tops of all the desks. During the three year period there were 28 failures out of 115 pupils in room A and only 9 out of 112 in room B. Teachers testified that holding the attention of the children was much easier in room B. The additional cost of electricity per year for room B was $24.33 or $73 for the three year period. The cost of education of each pupil was $28 per year. During that period the better illumination reduced the number of failures from 28 to 9. This leaves a difference of 19. To put these 19 pupils through a year's course for the second time therefore cost a total of $532 against an expenditure of $73 for extra electricity. No cost is given for the original change in lighting equipment, but this saving would amortize any such cost in short order. What the saving might have been had the new illuminating system been of really adequate intensity and distribution it is impossible to say.

Following will be found a brief listing of the more important factors to be considered by the architect in approaching the problem of school lighting with the desire to produce the best result attainable today. No attempt has been made to make this an exhaustive survey of the subject. It is merely intended to highlight those factors not commonly found in present day practice.

CHECK LIST FOR SCHOOL ILLUMINATION

STANDARDS

Intensities for General School Lighting.

8-12 foot-candles.	(I.E.S. and A.I.A. 1932)
15-20 foot-candles.	Minimum for normal speed of perception
30 foot-candles.	Efficient maximum work-benefit (normal eyes)
45-55 foot-candles.	Efficient maximum work-benefit (astigmatic)

Table of Intensities for Special Purposes. Present Good Practice.

Auditorium 8 foot-candles; during performance 0.1 foot-candles.

Classroom, library, offices, labs., manual training, fencing, boxing, wrestling, lunch room, 12 foot-candles.

All these intensities are distinctly practicable minima. They should be increased in the same relation as those for classrooms discussed above.

Corridors and stairs	5 foot-candles
Toilets	6 foot-candles
Shower room	6 foot-candles
Lockers	6 foot-candles
Drawing	25 foot-candles
Sewing	25 foot-candles
Handball	25 foot-candles
Basket ball	15 foot-candles
Pool	8 foot-candles

Distribution. Provide good diffusion to avoid confused shadows and sharply contrasting areas of light and dark.

Daylighting. Unilateral system is losing favor. Corner windows extending along two sides of room. Seating on diagonal.

Skylighting usually not practical for classrooms. Leaks, heat loss, maintenance more difficult than windows.

Clear-story lighting is well diffused and of good quality.

Color. Depends on type of work.

Color plates to correct filament type sources are very inefficient: some absorb as much as 85 per cent of light.

Optimum color for vision, rapid perception, is green-yellow (5,800 A°). Sodium vapor. Unpleasant color.

Color matching can be done with combination of neon gas and mercury vapor.

Fine manual operations — mercury vapor.

FACTORS DETRIMENTAL TO ILLUMINATION

Glare. Avoid exposed light source to illuminated surface of brightness greater than 2 to 3 foot-candles per sq. in.

Specular Reflection. Avoid polished surfaces in positions that will reflect light from any source into visual field of pupils or instructors. Consider finishes of desk tops, blackboards and other equipment.

Low Angle Sources. Human eye is especially sensitive to and unprotected against light originating below normal plane of vision. This governs heights of bottom of windows above floor in school rooms.

TYPES OF LIGHT SOURCE

Incandescent filament is now considered inefficient and expensive. Relatively short life of 1,000 hours requires replacement, in turn necessitating easy access.

Two-filament types (3 intensities of light) afford more flexibility.

Incandescent Vapor or Gas. Strong color characteristics:
Neon — yellow-red
Mercury vapor — blue-green
Sodium vapor — green-yellow

Combinations of these with each other or with incandescent filament types blend strong colors into approximations of daylight.

Current Requirements. High voltage stepped-up by small transformers placed as near light source as possible to save much heavy wire. This type does not burn out, since there is no filament. Sometimes develops the jitters due to faulty contacts.

Time lag before full intensity is developed.

TYPES OF INSTALLATION

Fixtures or Luminaires. *Direct.* Glare, confused shadows, no diffusion, easy maintenance, costs least per foot-candle on working plane, may be placed anywhere and requires no special ceiling or other structural reflector.

Semi-indirect. More diffusion and less tendency to make confused shadows. Less glare. Collects dirt with decrease of efficiency, especially if not enclosed. Costs more per foot-candle. Requires reflective ceiling.

Indirect. Good diffusion, no confused shadows, no glare. Harder to maintain, especially if not enclosed. Costs still more per foot-candle. Requires good reflective ceiling. Contrast between opaque reflector and ceiling may be too great for best appearance.

All these types require designed spacing, mounting heights, and the latter two consideration of efficiency of reflecting surfaces.

Built-in. Lens control. May be directed exactly where needed by simple flush fixtures neat in appearance. Prismatic plate stops spilling of light. Access for relamping and cleaning. Ventilation. Watch out for specular reflection, and low efficiencies.

Trough or cove. Good diffusion, no glare or shadows. Difficult to keep clean. Provide access for relamping. Requires structural reflector. Relatively expensive. Good appearance possible. Should not be used in rooms occupied for long periods at a time.

Directed-indirect. Efficient combination of features of direct and indirect illumination. Specially designed for a particular room to provide complete distribution and directional diffusion from few sources. May cost less than cove lighting and is easier to maintain.

MAINTENANCE AND CONTROL

Provide access for relamping and repair.

Provide access for cleaning.

Switches. Remote-control switching for large areas and

loads saves wiring costs because r-c. switch can be located near outlets and controlled itself with a small single pair of wires.

Photo-electric control for automatic switching on of artificial light when daylight fails.

All authorities unite in advising more than merely adequate wiring and provision of extra conduit for additional circuits because of probable increases in demand for current.

ILLUMINATION FOR SPECIAL PURPOSES

Classrooms. Diffusing globe unit limited in shape and size by allowable brightness. Dense semi-indirect bowl and full indirect types limited to 75-80 per cent output. Directed-indirect.

Blackboards and other vertical surfaces. Special overhead units, lens and reflector controlled, for vertical distribution.

Corridors and Stairs. Higher intensities accelerate student movement from class to class and are desirable from point of view of sanitation. Also required by current practice of placing lockers in corridors. See section on emergency lighting.

Laboratories. Commercial practice.

Shops. Industrial practice.

Gymnasium. Protected light sources. Lights over center line of track.

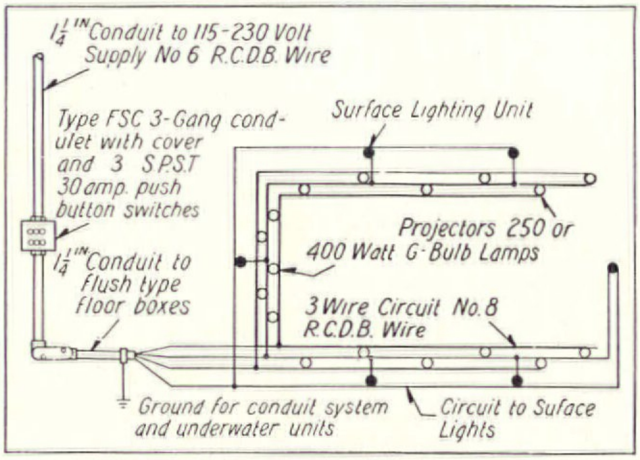
High mounting to leave clear play and exercise space. Flush, built-in units desirable.

Swimming Pool. Vapor-proof fixtures.

One light to be lighted at all times to show whether pool is full or empty.

Under-water Lighting. Number of small units spaced uniformly on sides and deep end.

Provide recesses in pool wall at least 2 ft. 6 in. below water-line to hold bronze boxes. The exact height should be such that all rays fall within the angle of total reflection from under side of the surface and none pass through the surface. Flexible, waterproof cable connection with terminal above waterline. Lenses to form horizontal fan beams. Deflected downward at deep end. Minimum load in watts equals twice area in square feet of water surface. Illumination at deep end 25 to 30 per cent. Color effects?



Wiring diagram for underwater lighting

Auditorium. Provision for stereopticon and motion picture projector (see article on auditoriums and bibliography).

Dimmer control for general illumination.

Color control for mood conditioning.

Orchestra pit outlets.

Exit lighting (on emergency system also).

Signal Systems. Projection booth to stage, point to point back-stage, dressing rooms.

Stage lighting (see bibliography).

Emergency Lighting. Based on use of more than one source either local battery or motor-generator set, or lines from more than one power station.

Corridors, stairs, auditorium exit lights.

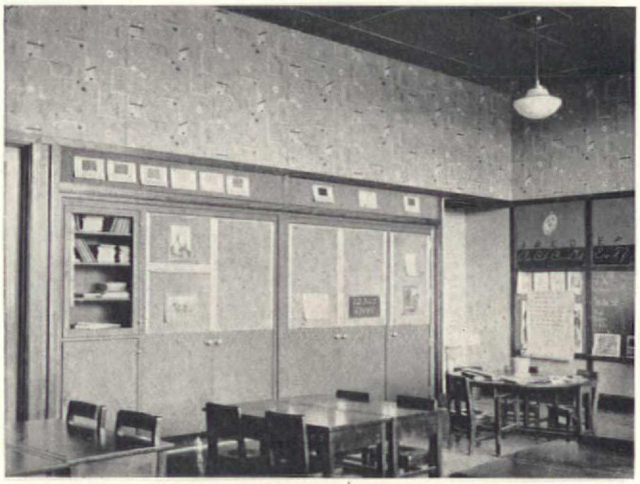
Automatic throw-over when regular system fails.

THE CLASSROOM

I: DECORATION

Far too often the classroom of today is singularly like the classroom of 25 years ago. Above a blackboard — black only in the early part of the day and, the rest of the time a dirty gray — the wall is painted a cream or buff of a peculiarly depressing shade. This is usually decorated with a choice of dreary photographs of the Parthenon, the Coliseum, or the Temple of Jupiter at Olympia or occasionally by dusty fly-specked plaster casts of Dante or Zeno. The rest of the room is generally left a cream or buff background for the mural efforts of the "Billy loves Mamie" school. The ceiling is usually white to cut down electric light bills.

If the pupils' parents had to remain in such a room for many hours there would be a frightful howl. Even the school auditorium where such parents do occasionally congregate is often of the same general type, supportable only on account of distraction by drama or parental emotion. Yet the psyche of the child is much more responsive to color than that of the adult and every hospital director knows that color may be a great aid to the physician. Is the teacher any less needful of such aid?



PATTERN AND COLOR

Lorenzo Hamilton, Architect

It is more and more generally understood that schoolrooms should have more and brighter colors. The specious plea that more intense color is expensive because it absorbs, and therefore requires, more light is now usually disallowed. In the first place there are points in a classroom, notably immediately adjacent to a blackboard, where light absorption is actually desirable to avoid contrasts fatiguing to the eye. And in the second place the psychological comfort of the pupil with its attendant rise in capacity to understand will reduce the number of those who have to repeat their courses and thereby save the taxpayers money at a far greater rate than it can be spent in electric light. Kindergarten specialists have already recognized this, with the result that the kindergarten departments usually approach a really suitable environment for the scholar. It is to be hoped that other classrooms will be given the same treatment.

In order to provide a greater amount and intensity of color there are but three simple things to be remembered. The first is that no very intense color should ever be used in large unrelieved areas. It should be broken with other colors, whether in the form

of conventional patterns or mural decorations. Interesting in this connection is the fact that in Mexico, where it has been necessary to lay great stress upon economy, there is a lavish use of mural decoration. The few actual examples in the United States run all the way from murals to standard commercial washable wall coverings.

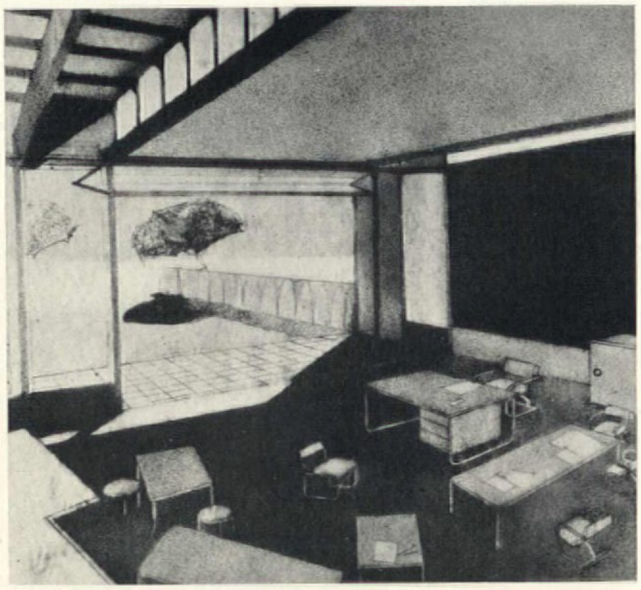
The second is that as the saturation of color increases the primary intensity of illumination the question of specular reflection becomes of increasing importance.

Third is the well-known fact of the variation between the stimulating and soothing properties of the colors of the spectrum as they run from red to violet. Mindful of these simple rules and guided by good taste, there is no reason why the architect cannot produce brightly colored, cheerful classrooms which will inspire instead of depressing the child. Surely this should be one of a classroom's functions.

* * *

II: EQUIPMENT

Classroom equipment has improved in the last few years, but not a great deal. There is still a tendency to regard the provision of a reasonably efficient desk and chair as enough. Again the kindergarten alone has shown an attempt to create a special atmosphere for a special purpose. In physics and chemistry laboratories much attention is paid to efficient equipment, but this attention is concentrated upon purely functional efficiency without regard to appearance. Even here the attempted efficiency breaks down. Manufacturers of such equipment call attention to the lack of interchangeability in such units as drawers with a consequent increase in cost of production.



SPECIALLY FURNISHED CLASSROOM

Richard J. Neutra, Architect

The classroom of the future in all probability will have individual furniture which is especially selected for that room in that school and not at random. This need not necessarily result in an undue increase in cost as the use of standard parts properly designed would save more than the use of standard design. Not only should this furniture be individual in design, but color must also be carefully considered. Some effort has been made in this direction, mostly in auditoriums, with upholstery in colored leathers or leather imitations.

There still remain questions of shelving, cupboards, cases, blackboards, bulletin boards and wall surfaces for pinning up posters or drawings. Each one of these has to be thought of individually in each room and not just picked out of a list at so many feet of each per room.

Another of the questions that will confront the architect in the future will be the matter of audio-visual instruction. More and more school principals and educators are refusing to be content with a single motion picture projection booth in the auditorium and demanding in the absence of commercially perfected television provision for portable motion picture with sound apparatus that may be taken from classroom to classroom. Of these there are two sorts. One uses standard 35mm. nitrate film, the other 16mm. acetate safety film. The former requires a fireproof booth and rather heavy feeder lines. The second has hitherto had the disadvantage of not being able to use sound-on-film recording. Now, however, the sound-on-film projection is available with protection from fire. No booth is required and the feeders are not so heavy. This smaller apparatus will give a 6½ x 9 ft. projection at distances up to 85 ft. with good definition. It requires a free floor space of 4 ft. square. This space should be predetermined and suitable outlets provided for power. This will take care of most conditions where portable apparatus is required. Naturally a screen, rolling or fixed, must be provided.

Another branch of this audio-visual education is the combined centralized radio and public address system. This is again waiting for television to make it complete. Already, however, apparatus is available which will permit radio broadcasts to be heard simultaneously in all rooms or to be heard in part of the rooms while the rest of the system is being used for an address by someone at the central point. Architect Harrison's school of the future for example (see page 56) would be administered by such means, together with other similar units, from a central station. Without going as far as this it is perfectly possible with apparatus now commercially available to have different classes within the building listen to a lecture by a brilliant teacher and yet remain each in its own classroom. This system can be carried much further, and, when television becomes a commercial fact, probably will be.

Although not ordinarily considered a classroom, school libraries are becoming more common and carrying a greater burden. To plan such libraries requires an accurate method of determining shelf capacities. A new method devised by Robert W. Henderson of the New York Public Library makes use of a new unit of measurement called by its inventor the "Cubook" and puts this type of calculation on a rationalistic basis for the first time. Having provided sufficient shelving, there should, in the school of the future, be accommodations for adults as well as children. These two different classes of readers require different atmospheres as well as different furniture. They should be separated sufficiently so that the inevitable whispering and chattering of the young will not disturb their elders. The question of the *apparent* cost of providing these and similar improvements is often raised as an excuse for their omission. It is possible, however, that proper education might lower the amounts of the taxpayers' money spent for such things as the suppression and prevention of crime by so educating children as to remove the predisposition to crime. In this way, and in many similar ways, the money spent for better schools would be really money saved.

A BIBLIOGRAPHY

of books and magazine articles published in the United States and in Europe on the Planning Construction and Equipment of Schools will be found on pp. 36-44. This should be consulted for a wider picture of the whole subject of technical advances.

BUILDING MONEY

A monthly section devoted to reporting the news and activities of building finance, real estate, management and construction

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JOHN CUSHMAN FISTERE
Editor

Esther Born

Man of the Month ARTHUR CORT HOLDEN (see Page 104)

LIMITED DIVIDEND ROLL CALL

Private enterprise offers in evidence six decades of housing, not all of it low cost, but almost always at a profit. From Boston in 1871 to Pittsburgh in 1934.

UNTIL last month the limited dividend corporation, as a source of low cost housing, appeared to have few friends. Its one-time champion, PWA Administrator Harold L. Ickes, as long ago as last spring announced that, except for the eight corporations with which he had already drawn contracts, he was through with all such agencies. And he promptly rescinded all allotments previously made.

Besides his feeling (it amounted to suspicion) that their sponsors were trying to make too much money on the projects, Ickes was firmly convinced, as nearly everyone else is, that private enterprise cannot cope economically with housing for the lowest income groups. The best he had been offered was $8 to $12.50 per room per month, and $6 was the rental he had in mind.

Today private enterprise has a new champion in Federal Housing Administrator James A. Moffett, who knew as little as Ickes did about slums when he first took office. Both have learned quickly. And now Moffett is just as positive that there is room for private limited dividend corporations in the housing field as Ickes is sure there is not. (See page 108 for blow by blow description of the Ickes-Moffett squabble.)

Moffett's Housing Administration last month made public its rules and regulations for insurance of mortgages on low cost housing projects. Before they were out more than a few days, applications for $102,000,000 worth of buildings were on his desk.* Private enterprise through limited dividend corporations, it seemed, was getting another chance at Government support. This time it will not be, as it was under PWA, through direct loans and grants, but simply through the insurance of mortgages. Private lending institutions will have to supply the money.

Since this is probably the third† and last opportunity private enterprise will have to obtain U. S. help, a survey of past successes and failures of limited dividend corporations may indicate how successful FHA encouragement will be. To use once again the most quoted of all Al Smith phrases; "Let's look at the record."

Boston Cooperative. Oldest of all limited dividend corporations still in existence is the Boston Cooperative Building Company, 63 years old in December. Launched modestly in 1871 with a few two-story houses on Andrew Place, its last annual report (1933) listed 249 family units, some houses, some apartments.

Boston Cooperative has not missed a dividend in all its threescore years. Its properties are old, but well maintained. With tenants predominantly Irish-American laborers, rents are exceedingly modest: $1.25 a week for its smallest one-room apartments and $6.50 a week for its four-room units. But even with rents like these, Boston Cooperative has been seriously hit by sorry times. Of its 249 units, only 193 were tenanted December 31, 1933. And for the last two years it has had to draw on its surplus to pay part of the dividends.

Its record for the last five years is shown in Table I.

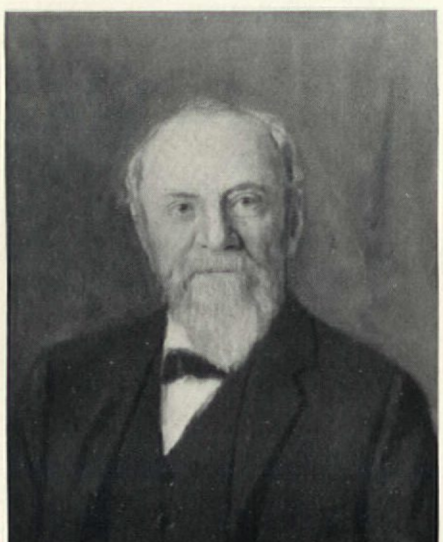
City and Suburban. Talk about low cost housing was no less feverish in the '90s than it is today. But of all the companies formed from 1890 to 1900, only two remain, the City and Suburban Homes Company of New York, and the Octavia Hill Association in Philadelphia.

Capital stock of City and Suburban Homes, fixed in 1896 at $1,000,000, has subsequently increased until in 1931 $6,000,000 was authorized and over $4,250,000 actually issued. Not only has its record of dividends been maintained along with its expansion, but the company's influence on housing has been second to none.

It was the architectural competition

*All but one in Meadville, Pa., it is reported, were returned to their sponsors for revision.

†Prior to PWA, the RFC attempted to stimulate low cost housing by offering 85 per cent loans to worthy projects. Fred F. French's Knickerbocker Village in New York was the only qualifier. See THE ARCHITECTURAL FORUM, December, 1934, page 458, for analysis of it.



Wurts

Founder Henry Phipps and Phipps Garden Homes, Latest and Best of His Posthumous Monuments

sponsored by City and Suburban Homes, and won by the veteran of all housing, Ernest Flagg, that ended the building of "dumb-bell" tenements. From architect Flagg's plans the first project was built on West 68th Street, in which wide courts and a square structure took the place of narrow light wells squeezed in between long rectangular building walls.

Two years after its first venture, the company embarked on a home building program in Brooklyn, building and selling between 1898 and 1908 a total of 248 houses. Its apartment building activities in New York showed no slack from 1898 to 1931.

Date	Location	Number of Apartments
1898.........	West 68th Street	373
1900.........	First Avenue	148
1901.........	First Avenue	190
1904.........	First Avenue	290
1904.........	West 62nd Street	45 (for Negroes)
1904.........	Avenue A	184
1906.........	Avenue A	186
1907.........	First Avenue	235
1907.........	Avenue A	172
1908.........	East 73rd Street	94
1910.........	Avenue A	300
1911.........	West 63rd Street	128 (for Negroes)
1911.........	Junior League Hotel	338 (individuals)
1911.........	Avenue A	200
1913.........	Avenue A	102
1914.........	Avenue A	113
1916.........	First Avenue	190
1920.........	Brooklyn	100
1931.........	Celtic Park	117
	Total	3,505*

*Includes 338 rooms for individuals.

In addition, City and Suburban has bought other apartment properties, and has sold some of its holdings. In no case has there been buying or selling for quick profit. All its investments have been predicated on long-term operation, and such sales as have been made can be charged up to such exceptional circumstances as shifts in population.

Besides paying its dividends consistently after setting up a reasonable amount for depreciation each year, the company had accumulated by April, 1933, a surplus of more than $1,380,000. The book value of its land and buildings on the same date was approximately $9,100,000. During the universally bad years from 1930 to 1933, its yearly income was good enough to bring the green glow to the eyes of any speculator — in excess of $1,225,000 each year. Its net earnings ranged from $263,000 to $445,000 for the same period. The company's growth in assets, income, expenses, and earnings is detailed in Table II.

One lesson above all others City and Suburban has for all similar companies: Don't build when construction costs are high. Not a nickel of the company's money was spent for new building from 1920 to 1930. When costs dropped in 1929, City and Suburban launched a large development.

Its history bears out well its purpose as stated in the by-laws: "To offer to capital a safe and permanent investment and at the same time to supply wage earners improved wholesome homes at current rates."

Condensed Statement of Earnings, Boston Cooperative Building Company
For the Years Ended December 31, 1929 to 1933

	1929	1930	1931	1932	1933
Rents received............	$46,443.55	$45,236.80	$42,519.80	$40,057.15	$36,958.95
Net income from rents......	16,809.00	9,752.41	9,967.32	10,175.15	5,992.99
Net operating income......	15,098.59	6,316.75	7,444.28	7,832.50	2,800.33
Net income...............	16,196.12	7,132.36	8,242.11	8,820.82	1,894.56
Dividends paid............	15,534.40	12,139.10	8,721.76	8,592.56	8,161.88
Net addition to surplus.....	5,144.09	9,675.35	479.65	228.26	74,842.15
Percentage earned on stock: $221,920.00 (11,680 shares par $19.00 per share).....	7.30	3.21	3.71	3.97	.85
$112,000.00)11,200 shares, par ($10.00 per share)....					1.69

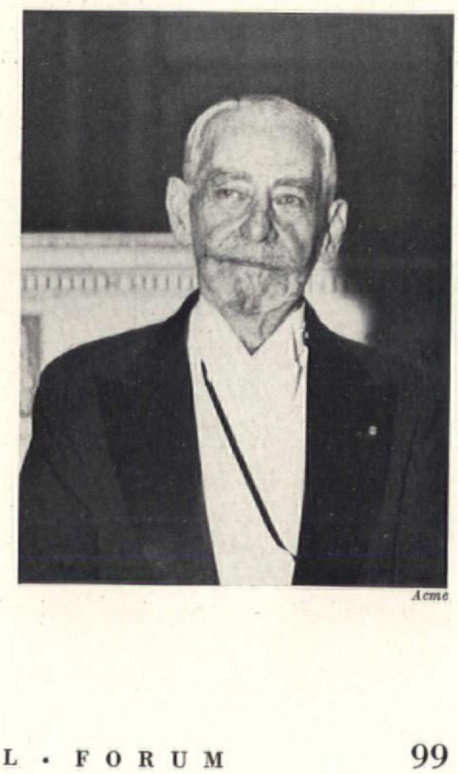
Table I

Growth in Assets, Income, Expenses, and Net Earnings of the City and Suburban Homes Company, 1924-1933

Year	Assets	Income	Expense	Net Earnings (div. and surp.)
1933...........	$9,880,174	$1,227,869	$964,264	$263,606
1932...........	9,740,431	1,335,975	938,427	397,547
1931...........	9,509,728	1,345,889	931,739	414,149
1930...........	9,688,313	1,348,848	906,489	445,079
1929...........	8,954,284	1,332,233	892,711	439,522
1928...........	8,661,943	1,296,659	881,229	415,429
1927...........	8,460,640	1,247,108	831,152	415,956
1926...........	8,643,930	1,242,565	891,322	351,243
1925...........	8,489,934	1,126,775	805,150	321,624
1924...........	7,636,472	1,204,671	900,295	304,376

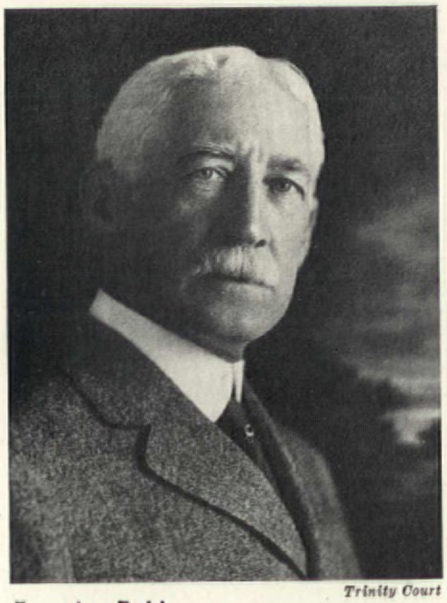
Table II

Gottscho



Acme

Celtic Park, City and Suburban's Latest, and Founder R. Fulton Cutting



Trinity Court

Founder Buhl

Octavia Hill. Unique among all U. S. institutions is the Octavia Hill Association, patterned in operation after the precepts of Miss Octavia Hill of London, who saw fifty years ago that the secret of good housing for the poor was as much good management as good buildings. The Philadelphia Association has a two-fold function. It manages its own buildings, and for a fee acts as agent for owners of low rent dwellings. In the latter capacity, it collects rents, makes alterations and repairs.

True to the traditions of the original Octavia Hill, its management is not the cold-blooded absentee landlordism that characterizes the management of most dwellings for the poor. Trained women only are hired for rent collections, and their contact with tenants is more like that of a social worker than a rent collector. Arbitrating family quarrels, helping find jobs, and giving medical advice are frequent elements in the routine.

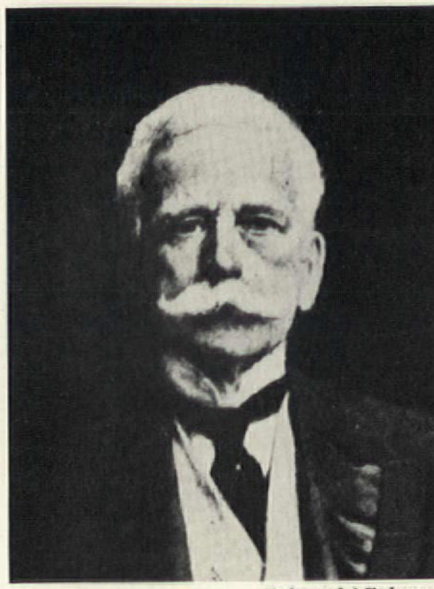
Almost all the properties owned by the Association are single-family dwellings, but the properties it operates for other owners include apartments and two-family houses.

For its management of other owners' property, the Association charges 7½ per cent, which though slightly higher than the management fees of ordinary companies, includes unusual services, not the least of which is the making of repairs at 10 per cent above cost by employes of the Association. On December 31, 1933, the number of properties owned and/or managed by the Association was:

	Association	Agency	Total
Properties	225	198	421
Families	228	283	511
Persons	856	827	1,683

For the last three years the Octavia Hill Association has not fared so well. Its net loss in 1932 was $9,729.30, and in 1933, $12,741.31. Its 1933 report issued last January commented:

"The question of profits has been wholly lost sight of, and the struggle has been to keep properties tenanted in order to avoid vandalism, with the result that all rentals have been materially reduced, and that at the close of 1933 the highest return is $20 per month for a house with five rooms and bath, while $10 a month is the rent paid for a two-room apartment or a three-room house."



Underwood & Underwood

Founder Field

Octavia Hill's record of the past three years is, however, no reflection on the soundness of the association's set-up. Had it been primarily interested in seeing to it that the 4 per cent dividend to which it has

Item	Brooklyn Garden Apartments, Incorporated		Academy Housing Corporation	Stanton Homes Corporation	Manhattan Housing Corporation	Stuyvestant Housing Corporation	Total eleven projects
	Fourth avenue project	Navy yard project					
Area of land, square feet	40,066	22,500	140,000	10,000	10,486	19,411	570,976
Area of buildings, square feet	21,020	12,950	61,424	6,875	7,280	14,056	303,096
Coverage, per cent	52.5	57.5	43.9	68.8	69.4	72.4	....
Cubage (approximate)	1,226,166	721,200	4,546,500	490,000	546,000	1,054,200	20,912,422
Height of ceilings in apartments, feet	8 ft. 1 in.	8 ft. 1 in.	8 ft. 6 in.	9	9	9	....
Number of apartments	164	111	475	44	[8] 44	95	[8] 1,918
Number of rooms [1]	670	395	1,774.5	144.5	[8] 165	353.5	[8] 7,356
Number of stores	12	....	8	8	....	12	....
Height (number of stories)	5 and 1 of basement and stores	5 and basement	6 and basement	6 and basement	6 and basement	6 and basement	....
Number of elevators	Walk-up	Walk-up	16	1	1	2	....
Gross floor area per room,[4] square feet	156.6	197	209.5	261	264.7	238.6	....
Approximate average area of living rooms, square feet	135	135	187	210	200	199	....
Approximate average area of dining rooms, square feet	115	103	....	215	....	....	....
Approximate average area of bedrooms, square feet	99	94	141.5	165	150	156	....
Approximate average area of kitchens, square feet	77	66	[5] 124	100	60	53.5	....
Cost of land	$100,905	$75,410	$204,500	$100,000	$58,250	$182,000	$1,733,065
Amount of land used per room, sq. ft.	59.80	56.96	79.59	69.20	63.55	54.91	....
Cost of land per room	$150.38	$190.91	$116.26	$692.04	$353.03	$514.85	....
Cost of improvements, inclusive of financing [5]	$634,685	$350,618	$1,775,500	$196,740	$221,700	$436,686	$8,428,009
Construction cost per room [5]	$945.88	$887.64	$1,009.38	$1,361.52	$1,343.64	$1,235.32	....
Construction cost per cubic foot [5]	$0.5176	$0.4861	$0.3905	$0.4015	$0.4060	$0.4142	....
Total cost [5]	$735,590	$426,028	$1,980,000	$296,740	$279,950	$618,686	$10,431,074
Total cost per room [5]	$1,096.26	$1,078.55	$1,125.64	$2,053.56	$1,696.67	$1,750.17	....
Mortgage	$420,000	$235,000	$1,320,000	$200,000	$170,000	$400,000	$6,535,000
Equity	$315,590	$191,028	$660,000	$96,740	$109,950	$218,686	$3,626,074
Ownership and management	Non-Co-operative	Non-Co-operative	Non-Co-operative	Non-Co-operative	Non-Co-operative	Non-Co-operative	....
Average rental	$10.74	$10.75	$10.93	[7] $12.33	[8] $12.39	$12.50	....
Approximate date of completion	July, 1929	September, 1930	July, 1931	December, 1930	July, 1931	December, 1931	....

[1] Includes dining alcoves and kitchenettes counted as half rooms.
[2] Two co-operative stores in basement.
[3] Seven stories on Broome street.
[4] Exclusive of basement.
[5] Includes dining alcoves.
[6] Includes cost of extra facilities such as auditoriums, schools, social rooms, etc. In the case of the Farband, cost of fixtures and equipment for the extra facilities are also included.
[7] Includes 19 dining alcoves and kitchenettes and 34 bathrooms counted as half rooms.
[8] Exclusive of 2 apartments of 15 rooms used for commercial purposes. Includes 44 dining alcoves and 11 bathrooms counted as half rooms.

New York's Non-Cooperative Housing in Square Feet and Dollars

Keystone

Founder Rosenwald

limited itself was earned, it could have done so. Its first concern was to its tenants. In its 37 years of operation, it has paid out only \$30,000 in interest to the holders of the 11,090 shares of outstanding stock (valued at \$277,250), but it has earned a surplus of \$32,596.83. This has been increased to \$130,876.47 by donations and bequests of \$98,279.64.

Phipps Houses. Back in 1905, the late Henry Phipps established Phipps Houses, Inc., with a gift of \$1,000,000. In that year it built a 140-unit apartment house in the low rental class. For twenty-five years it rented well, had a long waiting list of tenants. Three years ago its waiting list vanished, and for the first time it had vacant apartments on its hands.

In 1906 and again in 1912 it built apartment houses for Negroes, which have been filled ever since. Out of the earnings alone on these two projects Phipps Houses, Inc., erected three years ago one of the nation's finest housing developments, Phipps Garden Apartments on Long Island. With vacancies well under 10 per cent since completion, Phipps Garden Homes earned 4 per cent in 1932 and 1933. With rentals averaging about \$14.25 per room per month the likelihood is that it will again earn its 4 per cent in 1934.

Since there is no stock, there have been no dividends paid. The earnings from all properties will continue to be reinvested in new housing projects.

Cincinnati Model Homes. In 1911 the late Jacob G. Schmidlapp, one of Cincinnati's front rank *Deutsche* citizens founded Cincinnati Model Homes, Inc. Its capital was \$500,000, and its dividends were limited to 5 per cent. Prime purpose of the company was the building of decent homes at low rents for Negroes. That it accomplished its purpose handsomely and at the same time earned enough every year but one to pay its annual 5 per cent is one of the city's proudest boasts.

The balance sheet for December 31, 1933, showed capital stock outstanding of \$42,570 on 4,257 shares. Surplus amounted to \$545,146.95, of which \$383,130.00 had been paid in and \$119,446.95 had been earned.

With average rentals under \$6 per room, the company last year earned, after generous allowance for depreciation, about

Founder Schmidlapp

\$6,000. Its rent collections represented13.7 per cent return on the investment, and was split as follows:

1.9% for depreciation
1.8% for taxes and assessments
2.7% for maintenance and repairs
1.7% for overhead charges
0.2% for operating rooming house
0.8% for profit
0.1% for income tax
3.6% was lost through vacancies
0.9% was lost through default

13.7%

Along with its housing developments, Cincinnati Model Homes operates one grocery store, where its tenants and others living nearby can shop at chain store prices.

Item	Amalgamated Housing Corporation			Amalagamated Dwellings, Incorporated	Farband Housing Corporation
	First six units	Units seven and eight	Unit nine		
Area of land, square feet	148,477	60,000	26,506	60,000	33,530
Area of buildings, square feet	69,636	33,000	17,870	35,800	23,185
Coverage, per cent		51.3		59.4	69.1
Cubage (approximate)	4,247,796	2,400,000	1,304,560	2,800,000	1,576,000
Height of ceilings in apartments, feet	9	9	9	8 ft. 9 in.	9
Number of apartments	303	208	115	231	128
Number of rooms [1]	1,185	822.5	432	912	502
Number of stores	(2)	....	....	14	....
Height (number of stories)	5 and basement	6 and basement	6 and basement	[3] 6 and basement	6 and basement
Number of elevators	Walk-up	8	4	8	2
Gross floor area per room,[4] square feet	293.8	240.6	248.2	249	277.8
Approximate average area of living rooms, square feet	207	209	204	204	216
Approximate average area of dining rooms, square feet	205	193	....	200	216
Approximate average area of bedrooms, square feet	166	167	160	160	165
Approximate average area of kitchens, square feet	96	106	130	129	[5] 128
Cost of land	\$300,000	\$185,000	\$80,000	\$364,500	\$82,500
Amount of land used per room, square feet	125.30	72.95	61.36	65.79	66.79
Cost of land per room	\$253.16	\$208.99	\$185.19	\$399.67	\$188.36
Cost of improvements, inclusive of financing [5]	\$1,654,360	\$1,003,020	\$490,000	\$1,064,715	\$599,985
Construction cost per room [5]	\$1,375.53	\$1,249.09	\$1,134.26	\$1,167.45	\$1,369.83
Construction cost per cubic foot [5]	\$0.3895	\$0.4179	\$0.3756	\$0.3803	\$0.3807
Total cost [5]	\$1,954,360	\$1,188,020	\$570,000	\$1,429,215	\$682,485
Total cost per room [5]	\$1,628.69	\$1,458.08	\$1,319.45	\$1,567.12	\$1,558.19
Mortgage	\$1,200,000	\$800,000	\$380,000	\$960,000	\$450,000
Equity	\$754,360	\$388,020	\$190,000	\$469,215	\$232,485
Ownership and management	Co-operative	Co-operative	Co-operative	Co-operative	Co-operative
Average rental		\$11.00		\$12.22	\$9.73
Approximate date of completion	December, 1927	December, 1929	January, 1932	November, 1930	November, 1928

[1] Includes dining alcoves and kitchenettes counted as half rooms.
[2] Two co-operative stores in basement.
[3] Seven stories on Broome street
[4] Exclusive of basement.
[5] Includes dining alcoves.

Costs and Areas of New York's Cooperative Units

Apparently chain store efficiency is not part of the operation, for rarely does the store show a net profit.

City Housing. About ten years ago the most famous of all limited dividend housing corporations was formed — City Housing Corporation, of New York, builders of those two famed developments, Sunnyside on Long Island, and Radburn in New Jersey. Held up as model examples of all that is finest and best in low cost housing practice, neither development is a model of financial operation. Due as much to the depression as to ill-advised financing, City Housing Corporation recently underwent reorganization under Section 77b of the Bankruptcy Act. (See THE ARCHITECTURAL FORUM, October, page 301.)

During the early years the company was very prosperous. The fifth annual report in 1928 showed assets of $7,960,656. The capital stock outstanding amounted to $2,394,300, on which 6 per cent had been paid regularly, and a surplus of $33,622 had been accumulated. By December 31, 1929, total assets had increased to $10,900,274, and surplus to $340,802.

Then the company fell on evil days. In July, 1931, dividends were passed for the first time in order to conserve resources. Since July, 1932, holders of bonds and notes, all of whom were not so much interested in return on their money as they were in better housing, waived their interest to keep the company going. The present plan for reorganization, calling for additional capital, is simply a hitch in the trousers, preparatory to going ahead with the ambitious plans for both Radburn and Sunnyside.

The financial hot water in which the company finds itself is mostly of depression origin, plus a little too much optimism in its financing methods. To provide as attractive terms as possible to purchasers of homes, City Housing had required a down payment of only 10 per cent. The balance was secured by a first and second mortgage. First mortgages were sold through regular investment channels, but the seconds were used as collateral on notes and bonds issued by the company. Thus, the indebtedness of the company grew until it was out of proportion to its capital stock and surplus. On December 31, 1930, total indebtedness, including $7,258,000 of mortgage and funded indebtedness and notes and accounts payable of $485,000, totaled $7,743,000 as against capital stock and surplus of only $3,092,781.

When the depression caused home purchasers to default on interest and amortization payments, and home renters to default on their rents, the company could not meet its heavy fixed charges.

Under its reorganization plan, the company will undoubtedly alter its home financing methods and work back into a strong position as a company.

N. Y. State Housing Board. For the most concentrated group of limited dividend corporations one has to resort to those organized under the State Housing Board of New York. The Empire State, guilty of as horrible housing as any State in the country, is likewise as progressive as any in trying to solve its problem.

The record of the eleven projects built by the eight limited dividend corporations under the State Housing Law is the finest collection of low cost housing information available. The story is told annually in the report of the State Housing Board to the Governor of the State. No limited dividend corporation contemplating building under the sponsorship of FHA should fail to obtain copies of the State Housing Board reports.

New York's eleven projects are divided into two classes, those owned cooperatively by the occupants, and those owned by outside corporations. (See pp.100-101 for summary of all projects.)

The veteran among them is Amalgamated Housing Corporation, formed in 1927, and the builder of three units, one in that year, another in 1929, and a third in 1932. It is a cooperatively owned and managed company, sponsored by the Amalgamated Clothing Workers of America. A second corporation, Amalgamated Dwellings, Inc., was formed by the clothing workers in 1930, to build the now famous Grand Street Apartments on the lower East Side.

From the first year, Amalgamated Housing showed a net profit, never large, but a profit nevertheless. Amalgamated Dwellings was slightly less fortunate. It took two years before it was able to produce a net of $12,974.69. The earnings record of both units is as follows:

	AMALGAMATED HOUSING	AMALGAMATED DWELLINGS
1929......	$3,848.32	....
1930......	3,416.10	....
1931......	8,667.25	$ 9,538.59[D]
1932......	257.05	12,974.69
1933......	6,708.21	9,631.05

D = deficit

Another cooperatively owned project, organized by the Jewish National Workers Alliance of America, is the Farband Housing Corporation's 127-apartment unit building in the Bronx. Built in 1928, it paid a dividend every year until 1932 when it showed a net loss of $1,468.86. In 1933, it came back into the black with a profit of $551.93, and built up its surplus from $3,566.99 to $7,719.66. Its record of earnings is as follows:

1929......	$2,037.91
1930......	1,201.56
1931......	2,213.00
1932......	1,468.86[D]
1933......	551.93

D = deficit

All the other New York projects are non-cooperative. There are six altogether, three owned and operated by one group, two by another, and the sixth by a third group. All six have been consistent dividend payers in good times and bad. They have been well managed, and although none of them has hit the very low income group they have averaged less than the $12.50 per room per month required by the State Housing Act.

Through them accommodations have been provided for about 2,000 families. Operating under the close supervision of the State Housing Board, the companies, as are all limited dividend corporations approved by the Board, are tax exempt on the buildings for a period of 20 years.

Secret of all New York projects, cooperative and non-cooperative, is the excellent management given to all. In all cases management extends somewhat to management of the tenants as well as to properties. Unlike most other housing projects, half of the limited dividend corporations were organized by men not particularly interested in the possible philanthropy involved, but in the likelihood of a continued return on their investment.

Field and Rosenwald. In Chicago are two mammoth low cost apartment houses, both built as semi-philanthropies, one by the estate of Marshall Field, and the other by the late Julius Rosenwald. As in the case of nearly every other limited dividend project, neither of them reaches down to the lowest income groups, but each has been a comparatively successful dividend earner.

Last month, the Marshall Field Garden management announced that for the first time all its 620 apartments were occupied. Reason was the continued cutting of rents from the first average of $15 per room per month to the present average of $9.57 per room per month. The sliding of prices has been accompanied by a corresponding increase in occupancy.

Though no figures were available on earnings, Chicago realtors were of the opinion that Marshall Field's housing was still more of a philanthropy than a limited dividend corporation. It was, they said, a "limited-if-any-dividended corporation." Prime handicap to its operating in the black was the high cost of construction from 1927 to 1929 when it was built.

The Rosenwald Michigan Avenue Garden Apartments, tenanted by Negroes, operated profitably for its first four years, recorded its first net loss, $8,000, in 1933. During first three years, return on the $1,500,000 capital stock dwindled from 4 per cent to 0.9 per cent, but $280,000 of the $1,000,000 mortgage was amortized. Michigan Garden rents now average slightly under $10 per room per month, a decline of more than 40 per cent from the original set-up.

Washington. With its heavy Negro population, and large percentage of poorly paid white clerical workers, Washington, D. C., has a severe low cost housing problem. Despite the successful experience of

two semi-philanthropic limited dividend corporations, there has been little following of their example.

The two corporations are the Washington Sanitary Improvement Company, founded in 1897, and the Washington Sanitary Housing Company, founded in 1904. Together they have built and are renting 958 apartment units, housing 539 white families and 419 Negro families, at rents averaging approximately $5 per room per month.

The last financial report of the first company showed assets of $1,409,844.61, composed of $500,000 capital stock, $451,-200.22 reserves for depreciation, and a surplus of $458,644.39. From 1897 until 1923 it paid an annual dividend of 5 per cent, and from then on straight through the depression the return has been 6 per cent.

Washington Sanitary Housing has a similarly encouraging record. Of its $366,-692.00 assets, $200,000 is capital stock, $73,536 reserved for depreciation, and $88,116.68 surplus. For the first three years it yielded a 4 per cent annual dividend, and since then it has paid 5 per cent uninterruptedly.

Prudential. As a mortgagee and as a builder-owner, the Metropolitan Life Insurance Company has long been interested in low cost housing. A comparative newcomer to the field is Prudential Insurance Company of Newark, N. J., with two apartment groups complete and a third under construction. Prudential's first venture, the 406-apartment Chellis-Austin Group, has not been particularly successful. Completed in 1932, it was intended for laborers but is occupied by higher paid white collar workers. Its basic rent schedule of from $12 to $14 per room per month has been cut to $10.80 to $12.60, but still it is only 75 per cent occupied.

Prudential's second experiment, the Douglas Apartments for Negroes, was substantially helped along by the city's purchase of the land between the two apartment units for use as a park. So far only one unit of the development has been completed. The first of the tenants moved in June, 1934, and already the building is 96.5 occupied. Rents average from $8 to $10 per room per month.

Chatham Village. Henry Buhl, Jr., who owned a big department store in Pittsburgh, died in 1927, leaving behind him, among other things, $13,000,000 for the establishment of the Buhl Foundation. Eligible to engage in a wide range of "religious, charitable, educational and public" activities, the foundation decided to try its hand at better housing for moderate-salaried workers. The result was the now famous Chatham Village, on a hilltop just across the Monongahela from Pittsburgh's golden triangle.

Some day it will be a garden home community of 300 houses; today its garden homes number 129, and, with stores and garages, represent a total cost of $958,-864.29. On each of the 129 sites approximately $1,221.60 was spent; on each of the houses, $5,278.40, totaling about $6,500 per house.

Trinity Court

Director Lewis

The grounds, houses, and appointments, which have been described over and over again in professional magazines, represent the best thinking of Ingham & Boyd, Pittsburgh architects, plus the not inconsiderable help of New York's housing twins, Clarence Stein and Henry Wright. Here it is only necessary to say that the houses are an excellent adaptation of the row-house principle to the hilly slopes of Pittsburgh, built as solidly as an Oak Park mansion, and equipped as completely as a Park Avenue duplex or triplex apartment.

Before the architects drew a plan, the Foundation's manager Charles F. Lewis, who left his job as chief editorial writer of Pittsburgh's Progressive *Sun* to direct the Foundation's work, made a three-year study of the best housing in Europe and the U. S., and of Pittsburgh's housing problem. He concluded that to meet the needs of Pittsburgh's moderate-income group, he could not bring monthly payments down low enough to sell the houses. Therefore all Chatham Village houses are rented.

The Village has been occupied nearly three years — and occupied is used advisedly. The first year its vacancy was 2.32 per cent, the second 1.03 per cent, and for the year ended January 1, 1934, 0.17 per cent.

For the first year the average rent per room per month was $11.35. During the last two years, it seemed sound policy to whittle that down to $9.70. The average annual rental income for the three-year period has been about 12 per cent of the total investment, or approximately $103,-000. Of this approximately 2.50 per cent is for taxes, 2 per cent for house and garden maintenance, 1.25 per cent for management, insurance and contingencies, 1.25 per cent (which is equal to 1.50 per cent of the building cost) for amortization, and 5 per cent for net yield. The amortization fund is reinvested and compounded semiannually at 4½ per cent and is intended to retire the building cost in approximately 31 years.

What makes Chatham Village significant to the prospective organizer of a housing development is the financially successful application of long term investment management policy. Though its funds come from a source that is socially minded, if not philanthropic, there is no thought of charity in the operation of Chatham Village.

Aerial Surveys of Pittsburgh, Inc.

Chatham Village, Across the Monongahela

GABRIEL OVER BLOCK 326-A

Architect Arthur C. Holden's plan for owner cooperation to rehabilitate slums may soon be in operation. What some owners in an actual block think of it.

Block 326-A, Manhattan, is bounded by Grand, Broome, Cannon and Lewis Streets. On it squat thirteen "dumbbell flat" tenements and a number of others of no particular breed at all. Two blocks west is the successful Grand Street low cost housing green which New York's Governor Herbert H. Lehman personally helped finance. A block or so further on, the wholesale fish markets along the East River stink to heaven. Overhead and a little north, the Williamsburg Bridge indicates the way to Brooklyn's slums which New York's Housing Authority is hoping to clear, and some distance south Mr. Fred F. French's white collar apiary, Knickerbocker Village, is a-buzz.

There is a depression in Block 326-A. Three-fourths of its residents share adversely in its consolidated monthly deficit of $463.68. Like many another tenement-crammed block in every U. S. city, Manhattan's 326-A is a loss to society, not only because it fails to carry its share of the cost of such essential services as fire, health and police protection, but because it contributes much to the high cost of these services. Thus generally indicted, it stands with its partners in the crime that is the lower East Side, an undistinguished mendicant for PWA housing aid. But there is another and more imminent Gabriel over Block 326-A.

For Block 326-A is the one with which Mr. Arthur C. Holden has chosen to press the cause of Block Reorganization. Last month, with tentative assurances of cooperation from owners of 65 per cent of the appraised value of the property involved, a unique slum rehabilitation scheme, long championed by Architect-Economist Holden, seemed well on its way toward realization.

Holden. Outgrowth of years of theorizing, much writing and a good deal of earnest arguing on the part of slight, 44-year-old Architect Holden, Block Reorganization doubtless struck some listeners last month as just another catchphrase for a quite familiar proposition. For being a dexterous writer and a man of strong enthusiasms, Architect Holden has advocated his plan for real estate from whatever pulpit he could during the past two years.

Not out of his apprenticeship with the distinguished architectural firm of McKim, Mead and White, nor from his experiences in designing swank suburban residences for Manhattan's well-to-do, had Architect Holden drawn his theories. Early as 1926 he was a consultant to the New York State Board of Housing, and in 1927 he was to be found helping re-write New York's tenement house law. In 1928 he designed a group of garden apartment houses on Manhattan's upper East Side, and later drew the plans for a rehabilitation project called Minetta Lane Dwellings, in an Italian section of Greenwich Village. Soon after the latter was carried out, its units were severed by a street's extension.

With the depression Architect Holden's practice, like that of most architects, was at a standstill, and more and more he interested himself in low-cost housing and city planning problems. He figured notably in President Hoover's Conference on Home Building and Home Ownership, and last year was a member of Dr. Alexander Sach's Division of Research and Planning in the NRA. Meanwhile, the activities of young Robert W. McLaughlin, Jr., the McLaughlin of Holden, McLaughlin & Associates, whose American Houses, Inc., has made a fairly successful attempt at the marketing of a prefabricated house, received his sanction and counsel, if not his sponsorship.

An energetic participant in whatever cause appeals to his intellect, which is distinctly a Princeton man's despite the urban polish Columbia gave it, Architect Holden is a short, extremely serious person, of a lean, square build, undeniably youthful in appearance and action with his short-cropped hair and his quick smile. His hobby is riding, but he enjoys just as much helping his wife, the former Miriam Young of Boston, with her charity chores in Harlem. Naturally enough, then, it was in Harlem that the earliest of the research to culminate in Block Reorganization was carried out.

Block Reorganization. Early in 1932, impressed with the lack of information at hand on the condition of real property in New York, Architect Holden and the Land Utilization Committee of the New York Building Congress, of which he is a member, contemplated the initiation of fact-finding studies, looking toward a plan for orderly rehabilitation of real estate. Forty unemployed technical men were secured through

A New Start in Life for a Block on New York's Lower East Side

the Architects' Emergency Committee and the Harvey D. Gibson Committee, and these studies, launched in Harlem, were well under way when in November, 1933, Technical Director Holden secured a contingent of 50 extra men from the Civil Works Administration through Borough President of Manhattan Samuel Levy.

The project's good fortune held out still longer, as it readily qualified as a part of New York's Real Property Inventory, and to it, as Project 33, under the wing of the New York City Housing Authority, Tenement House Commissioner Langdon W. Post could parcel out an unlimited number of men. The number of researchers engaged in these fact-finding studies under Mr. Holden's technical direction once reached a peak of 256. As the CWA is no longer, the present force is on city relief.

The ills recorded were in terms of vacancies. Crisply Director Holden squiggled his prescription:

"It's only common sense that the quickest way to reduce the cost of operating our vacant apartments, and thus to increase our net, would be to get rid of them altogether. Few owners can successfully tear out the vacant apartments from their individual buildings. Several owners can, however, enter into combination so that their present tenants may be concentrated and accommodated more economically in more available buildings.

"All that is necessary is a legal contract to receive the rents jointly and jointly to share the carrying expenses. In such a way a neighborhood can be gradually improved and the way prepared through the concentration of vacancies for the creating of open land. Open spaces will in turn prepare the way for a new building program. Thus may obsolete buildings be progressively replaced with new housing built and owned by a cooperative group of owners with no expense for the acquisition of land except the comparatively insignificant expense of drawing up the joint contract and appraising the participating share in it of the various owners."

Convinced that present losses are mostly incurred through taxation on, and the expense of maintaining, unoccupied space, Director Holden and his researchers propose no gigantic expenditures. The first step in Block Reorganization simply calls for the demolition of this unused space and a thorough refurbishing for the remainder.

In the case of Block 326-A, the resulting admission of light and air is apparent from the pencil perspectives reproduced on the page opposite, while the resulting situation as to earnings is shown in the chart below.

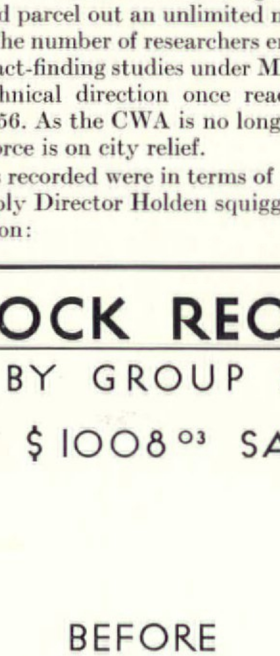
The diagram in the latter shows the coverage on the block before and after reorganization. In each property, before reorganization, appears a small symbol, which is a square if the property is earning a profit before financing charges and a circle if there

BLOCK REORGANIZATION

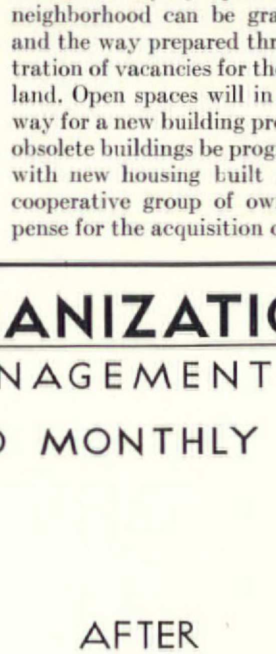
· BY GROUP MANAGEMENT ·

$\$1008^{03}$ SAVED MONTHLY

BEFORE



AFTER



KEY

☐ PROFIT before FINANCING
◯ LOSS " "
[M] M'T'GE INTEREST EARNED
(M) " INT. NOT EARNED

BLOCK · 326-A

COMPARATIVE ANALYSIS

	BEFORE	AFTER
OCCUPANCY	60%	99%
COVERAGE	85%	58%
TOTAL NO. APT'S	329	196
TOTAL NO. RENTED	194	194
TOTAL NO. VACANT	135	2
GROSS INCOME	**$\$4415^{00}$**	**$\$4415^{00}$**
OUTGO		
OPERATING	2626^{61}	1682^{87} *
TAXES	800^{92}	665^{27}
TOTAL	$\$3427^{53}$	$\$2348^{14}$
PROFIT before FINANCING	**$\$987^{47}$**	**$\$2066^{86}$**
FINANCING		
M'T'GE INTEREST	1105^{33}	736^{88} (4%)
AMORTIZATION	345^{82}	714^{27} (2%)
TOTAL	$\$1451^{15}$	$\$1451^{15}$
DEFICIT MONTHLY	**$\$463^{68}$**	
PROFIT "		**$\$615^{71}$**

COST OF REORGANIZATION

MOVING OF 58 FAMILIES AT 5^{00}	290
REFURBISHING OF 9 BUILDINGS	5000
GRADING AND FENCING	945
WATERPROOFING OF WALLS	2600
ADMINISTRATIVE AND TECHNICAL	1767
TOTAL COST	$10,602

PROFIT AFTER FINANCING	615^{71}
INT. AT 4%, AMORT. AT 4% ON $10,602 (COST OF REORGANIZATION)	70^{68}
PROFIT AFTER REORGANIZATION	**$\$545^{03}$**

* OPERATING COST AFTER REORGANIZATION		1820^{80}
10% SAVING BY GROUP MANAGEMENT	182^{08}	
LESS 1% MANAGEMENT FEE	44^{15}	137^{93}
TOTAL OPERATING COST BY GROUP M'G'E'NT		$\$1682^{87}$

ECONOMIC STUDIES N.Y.C. HOUSING AUTHORITY PROJECT 33 T.H. DEPT. LANGDON W. POST COMM. LAND UTILIZATION COMM. N.Y. BUILDING CONGRESS ARTHUR C. HOLDEN DIRECTOR

is a loss before financing. The symbol M is given where the property is mortgaged. This M is placed in a square if the earnings on the property are adequate to pay a profit after interest charges. The M is circled if the earnings are inadequate to cover the interest.

Owner Reaction: A Case Study. In Block 326-A there are approximately 300 householders. To these goes Block Reorganization's Researcher Isaac Israels with Block Reorganization's story. It is his job to get them to sign a mimeographed statement saying "I APPROVE THE PROJECTED REORGANIZATION AND RESULTING IMPROVEMENT IN BLOCK 326-A. I WOULD BE GLAD TO REMAIN AND PROMISE TO COOPERATE AS A TENANT IN THIS BLOCK." Researcher Israels knows his Yiddish, knows how to sit down and reason softly with his people. He gets their signatures; and these, as Researcher Clifford F. Hart is prepared to tell you, count heavily with dubious landlords. Researcher Hart goes to see the owners and the mortgagees.

From Researcher Hart's files come these records of property owner reaction to Block Reorganization:

Case 1. The ———— Estate's lots comprise 14.6 per cent of the total assessed valuation of Block 326-A.

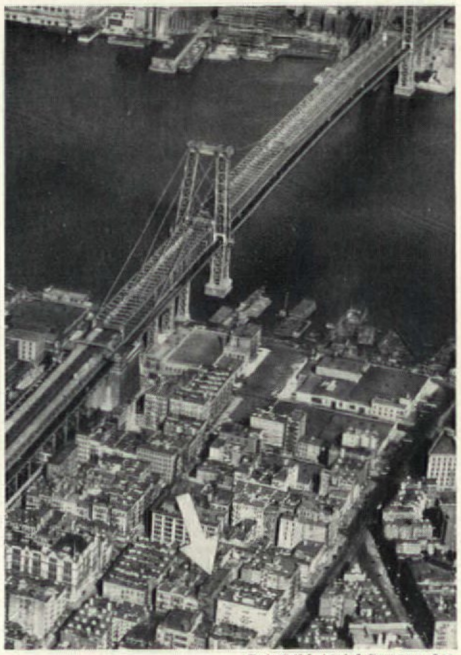
Mr. ———— expressed his unwillingness to enter any plan of group ownership. When confronted with the fact that the near future presents no probability of a profitable sale, he stated that nobody knows what the future of a real estate market may be, that something may develop overnight. In maintaining this, he probably has in mind recent announcements of government expenditure of five billion dollars on Housing.

Case 2. In charge of the ———— Life Assurance Society's real estate in this city, Mr. ———— views our proposal with approval, while pointing out the legal restrictions which prevent insurance companies from participating. His company withdrew from activity on the East Side some years ago, he states, and has only two properties there now. These are one on Broome Street and one on Houston Street.

He emphatically disagrees with any owner who refrains from joining a Block Reorganization because of speculative possibilities in the future of this particular neighborhood. Is of the opinion that it will take a long time for normal activity to overcome the high land prices asked there.

The Broome Street property, Lot ——, is losing money for his company. He will attend a meeting of owners when notified. If any expedient can be offered to overcome the legal difficulty mentioned, he will present our proposal to his real estate committee.

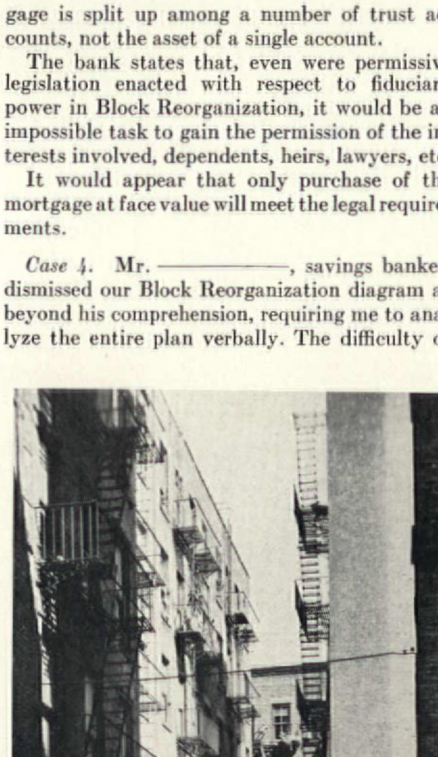
Case 3. This bank holds the first mortgage on Lot ——, the tenement at —— Grand Street. This mortgage is in a trust account, as are the bulk of mortgages in this type of institution. The interest and amortization are in arrears and foreclosures appear a probable result. Mr. ———— sees no feasible way of negotiating with us. One of the difficulties lies in the fact that the mortgage is split up among a number of trust accounts, not the asset of a single account.


Fairchild Aerial Surveys, Inc.
Over Block 326-A

The bank states that, even were permissive legislation enacted with respect to fiduciary power in Block Reorganization, it would be an impossible task to gain the permission of the interests involved, dependents, heirs, lawyers, etc.

It would appear that only purchase of the mortgage at face value will meet the legal requirements.

Case 4. Mr. ————, savings banker, dismissed our Block Reorganization diagram as beyond his comprehension, requiring me to analyze the entire plan verbally. The difficulty of combining so many diversified interests appeared to him as possibly insurmountable, but he agreed that the attempt was worth making.


Inside Block 326-A

He was surprised to learn that we are actually engaged in the application of our plan to a specific block. His bank owns a parcel in that block. Mr. ———— says the Savings Banks Trust Co. will be able to handle this specific parcel in our organization of the block.*

Case 5. One of the Lewis Street properties condemned and in disrepair, is part of the general assets of the ———— Mortgage Guarantee Co., not the possession of certificate holders of a mortgage issue. We can, therefore, deal with the company directly.

Mr. ————, vice president, expresses great interest in our proposed reorganization of the block. He has no patience with any move, similar to Knickerbocker Village, which would increase congestion and concentration. Feels very strongly about that phase of housing.

Mr. ———— will attend our owners' meeting when we call upon him. He will do what he can to arrange a release of the ownership for stock, although he doubts the possibility of doing that. His company is in the hands of a receiver, i.e., "in rehabilitation." He says the deed could, in the interest of improved conditions, etc., be acquired for a nominal fee.

Case 6. Mr. ———— is attorney for one of the two owners of Lot ——, and will represent the other owner in regard to this specific property.

Mr. ————, alert to present housing activity and optimistic concerning a government-financed move for the East Side, is interested in our proposal. He realizes that a very great improvement will be required to lift his client's heavily mortgaged parcel out of the red.

He asked pertinent questions concerning the people and organizations promoting our plan and made politely guarded inquiries concerning my personal interest. Expressed a real interest in our proposal, went over all the alternative organization possibilities and appeared to have a complete grasp of the subject discussed.

Mr. ———— requested that we keep him informed of developments and promised to give our plan full consideration.

Case 7. Mr. ————, attorney for the owner of Lot ——, expresses his unwillingness to advise his client that our proposal meets with his approval. This attorney appears to be closely associated with Real Estate and has a very set view-point.

Abrupt and impatient, he demanded our proposal in as few words as possible. Then he said he would not advise his client to surrender his deed for a flock of "maybes." He offered me his advice and "would not charge us anything for it." Then he stated that we should get options on the individual properties, then we would be in a position to talk to other owners.

Among these cases are nearly all of the outstanding recalcitrants. Fourteen owners

*The Savings Banks Trust Co., an agency established in 1933 as a credit reservoir for New York's savings banks, set up machinery last October for large-scale rehabilitation of new law tenements on which savings banks hold mortgages, which, in effect, allows these institutions to invest added money in such properties to make them income-producing (see THE ARCHITECTURAL FORUM, November, 1934, page 385). By the middle of last month, however, large-scale rehabilitation's motor had not turned.

go to make up the group representing 65 per cent of the appraised value of the block, all of whom have expressed their friendliness toward Block Reorganization. The first of the owners' meetings, which these fourteen have promised to attend, was slated to be held early this month.

Apportionment. To demonstrate to owners the benefits to be derived from Block Reorganization, the tables reproduced herewith have been worked out to show how improved earnings might be apportioned among the individual lot owners after reorganization. In these, each participating owner's share in the net income after reorganization is arrived at by adding to the present income or loss on his lot his share in the savings brought about through demolition and group management, based on the assessed value of the property.

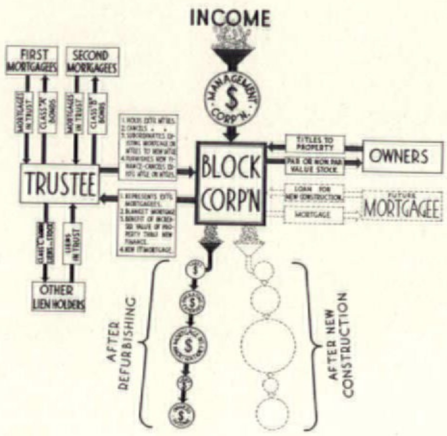
Admittedly, there is a greased pig in the china shop. For Block Reorganization's proponents would be far from satisfied to see any program of apportionment proceed on the basis of assessed valuations, and consequently they have for months been in search of a sound method for re-appraisal. The appraisal problem is an issue which from the first has interested mustachioed young Oscar Fisher, the project's "director of interpretive relations," and a special contingent of researchers under him.

The Pooling Process. Director Holden and his researchers had several plans in mind last month for pooling the various interests concerned in Block Reorganization, and to dramatize what they considered the best of these they exhibited a chart which looked like a cross between a Christmas-shopping robot and a meat grinder (see cut).

One plan being considered involved the formation of a "block corporation" by the owners themselves. They convey their titles to the corporation in return for which the corporation gives them shares of stock in proportion to the values of their properties as found by an appraisal. Under this plan the mortgagees retain their respective mortgages, as do other lien holders, such as judgment creditors, etc. The mortgagees agree to (1) extend the time for payment of arrearages of interest, (2) waive their rights to foreclosure for a period of 5 years, and (3) authorize the corporation to make improvements or alterations. Also they may agree to reduce the rate of interest in exchange for assurance of a steady income from the mortgage debt. The corporation pays taxes, operating expenses, and interest to mortgagees out of the income remaining.

In another plan the mortgagees join with the owners in the formation of the corporation. The owners convey their titles; the mortgagees cancel or release their mortgages. The corporation gives stock to owners and mortgagees — preferred to mortgagees; common to owners. The other lien holders also release their liens. The common stock of the owners of properties subject to liens is held by the lien holders as security for their claims.

Seemingly most feasible is a plan in which there are two corporations, one made up of the owners only, the other of the mortgagees and other lien holders only. The latter corporation, in effect, is a trustee for the mortgagees and lien holders (see chart). The mortgagees and lien holders assign their interests to the trustee. The trustee gives them bonds — Class A bonds to the first mortgagees, Class B to second mortgagees and Class C to the other lien holders. The trustee may either hold the existing mortgages and other liens as they are or replace them with a new blanket mortgage. The trustee issues its bonds to the respective holders. It may invest more money and take a larger blanket mortgage, or more money may be invested by others and the trustee might subordinate the existing mortgages and liens or the blanket mortgage to the mortgage given to the new investors.



The Most Feasible Plan

Block Reorganization had no precedent in the real estate world. It had only the argument of good business against a whole flock of predilections and laws. It at once collides with certain features of existing banking statutes, one of them being that lending institutions have been prevented from exchanging old mortgages for new obligations. Life insurance companies in New York cannot handle split mortgages, although, as Director Holden points out, they can deal in stocks and bonds.

But as Interviewer Hart came back each day last month to report a slowly mounting percentage of interest in Block Reorganization from Block 326-A itself, Project 33's three \$22-a-week lawyers only buckled down the harder to their study of the loopholes and barriers provided by existing laws.

To them and to Director Holden, who, with 70 New York blocks now under study for Block Rehabilitation, says it is "advanced Capitalism and not Socialism" which he is proposing, who sees no reason why real estate should not have its Standard Oil, who confidently expects that some day real estate speculation will center about a stock exchange, while proper management assures a stable building industry, these things seem not at all insurmountable.

INCREASE OF BLOCK NET INCOME AFTER REORGANIZATION & GROUP MANAGEMENT

CENSUS TRACT NO. 10 — BLOCK NO. 326-A.

SAVINGS DUE TO DEMOLITION	\$ 941.46	
ADD. SAVINGS IN OPERATING COSTS BY GROUP M'GEM'T	182.08	
TOTAL ADJUSTMENT (COL. 3)	164.69	\$ 1123.54
1% MANAGEMENT FEE	44.15	208.84
AMOUNT TO BE SHARED BY EACH LOT AFTER REORGANIZATION		\$ 914.70

LOT NO.	1 PRESENT NET INCOME OR LOSS \$ (BEFORE FINANCING)	2 % OF BLOCK VALUE BASED ON TOTAL ASSESSED VALUATION	3 ADJUSTMENT INCREMENT \$ SEE NOTE	4 SHARE IN SAVING AFTER ADJUSTMENT (914.70 X COL. 2)	5 TOTAL SHARE IN NET SAVING (COL. 3 + COL. 4)	6 TOTAL NET INCOME AFTER REORGANIZATION (BEFORE FINANCING) (COL. 1 + COL. 5)
3	163.26	5.5		50.31	50.31	213.57
4	- 16.77	4.2	1.77	38.42	40.19	23.42
5	- 61.65	4.2	48.19	38.42	86.61	24.96
6	- 68.48	4.2	55.02	38.42	93.44	24.96
7	13.93	0.8		7.32	7.32	21.25
8	11.86	4.3		39.33	39.33	51.19
9	- 11.01	2.5		22.87	22.87	11.86
10	4.42	2.9		26.53	26.53	30.95
11	- 44.38	3.1	28.90	28.36	57.26	12.88
12	- 16.38	3.1	.90	28.36	29.26	12.88
13	6.65	2.6		23.78	23.78	30.43
14	- 9.96	2.9		26.53	26.53	16.57
15	- 20.84	1.8	8.14	16.47	24.61	3.77
16	- 26.78	3.1	12.60	28.36	40.96	14.18
18	78.82	3.8		34.76	34.76	113.58
19	93.06	2.9		26.53	26.53	119.59
20	- 23.35	2.6	9.17	23.78	32.95	9.60
22	294.96	5.2		47.56	47.56	342.52
24	110.97	10.4		95.12	95.12	206.09
26	131.65	4.8		43.91	43.91	175.56
27	- 9.49	2.2		20.12	20.12	10.63
28	214.27	4.4		40.25	40.25	254.52
29	- 18.79	3.4		31.10	31.10	12.31
30	191.34	15.1		138.12	138.12	329.46
	\$ 987.47	100.0 %	\$ 164.69	\$ 914.70	\$ 1079.39	\$ 2066.73

Note: Adjustment increment represents difference between present losses and actual cost of operation after individual demolition.

ECONOMIC STUDIES N.Y.C. HOUSING AUTHORITY PROJECT 33 T.H. DEPT. LANGDON W. POST, COMM. LAND UTILIZATION COMM. N.Y. BUILDING CONGRESS ARTHUR C. HOLDEN DIRECTOR

Apportioning the Increased Proceeds

20 PER CENT GIFTS TO BUILDERS

loom on the Federal housing horizon: FHAdministrator Moffett and PWAdministrator Ickes sign a Roosevelt truce.

ONE day late in November the freest talker of all the Rooseveltians, Secretary-Administrator Ickes, was outlining to newsmen his plans for United States-built housing. Possibly irked by Federal Housing Administrator Moffett's comments of the day before that private initiative through the FHA could now relieve PWA of the burden of low cost housing, the Secretary commented:

"I've seen no evidence that the holders of private capital are ready to use it. But we can't afford to sit around indefinitely waiting for private capital to get going. I subscribe to the theory that a very large amount of public money should be put out so that industry can be pepped up in a hurry."

Next day at Moffett's press conference, reporters baited him with Ickes' belittling of FHA's prospects, and Moffett too spoke freely:

"The minute the government sells direct to the people generally you compete with private enterprise, and it couldn't be done. It simply can't be. If the National Housing Act is a real act and Congress meant it, you can't do that. It was intended to provide liquidity so that private capital would come in. People are not going to put up their money in mortgages if the government is competing."

Such open conflict between his two big housing men caused no little disturbance to the President, away on a recuperative vacation at Warm Springs, Ga. To the White House Ickes and Moffett were called by Secretary Stephen H. Early for a long distance telephone conversation with their chief. When the receivers were hung up at both ends, Messrs. Ickes and Moffett must have smiled as they signed their names to a public kiss-and-make-up statement.

"It seems a pity that either misinterpretation, or a desire to stir up trouble where no trouble exists, should have given rise to stories which create the impression that there is a divergence of view between the Housing Administration and the Public Works Administration. . . .

"The two administrations perform wholly different functions, affect the lives of wholly different groups of people and each administration is proceeding to carry out its own assignment without conflict with the other.

"We met today at the suggestion of each of us. It was the first occasion we had to sit down together and discuss the jurisdictions of our respective administrations. We found that we were in substantial accord. . . .

"We suspect that there is a disposition in certain quarters to make it appear that there is a difference of opinion between us. We decline to furnish the material for a Roman Holiday for those who are trying to create this impression."

HAROLD L. ICKES
JAMES A. MOFFETT

All of which was promptly interpreted by the public to mean that although they were still as far apart in their views as they were at first, they would do no more sparring in the open. Within a few days of each other, both were called to Warm Springs to present their briefs to the President. There the issue became clearly defined.

Underwood & Underwood

Title II Man Byers

Public vs. Private Spending. The President is still certain that a revived building industry will restore normalcy. To revive it, two paths are open to him—(1), the encouragement of private enterprise through the Federal Housing Administration, and (2), direct government spending. He would be happy indeed if revival could be brought about solely through the efforts of FHA. His distaste for huge United States outlays, coupled with eventual heavier taxation, is just as keen as the taxpayers'.

A second, and only slightly less consideration in his mind, is the utterly inadequate housing now available for the $1,500 a year income families, who are able to pay only $5 a room a month, and who are able to buy houses costing less than $2,500, if at all.

Nowhere in the records of past housing experience is there any evidence that private enterprise can fill either of these needs. Administrator Moffett is convinced that the trick can be accomplished with the help of FHA mortgage guarantees. Administrator Ickes is certain it can't.

Though he had, up to the middle of last month, not made known his intentions, it was thought the President would side with Ickes, although not to the degree the Administrator was hoping for. All the rumors emerging from Washington and Warm Springs boiled down to a guess that Congress would be asked to give Ickes about $1,000,000,000 for slum clearance, $5 per room-per-month housing, and subsistence homesteads costing less than $2,500.

The rest of the field would be left to Moffett—insured mortgages for as low cost housing as limited dividend corporations could manage (about $8 to $12.50 per room per month), and insured mortgages for individually built homes.

Should the time come this year or next when the FHA insured mortgage plan shows itself to be capable of producing housing for all classes of wage earners, government-built houses will stop.

Moffett's Scalp. Washington was interesting itself in one other rumor last month, a rumor based almost entirely on the fact that Administrator Moffett's appointment has not yet been approved by the Senate.

As the champion of big business, Moffett has already made himself *persona non grata* with a handful of progressive Senators. It may be, say the forecasters, that when the time for confirmation arrives in January, the President will be engaged in heavy bargaining with the legislators, and that he may see fit not to press for Moffett's approval in order to gain some more important point.

Signs of discord appeared within the Housing Administration too. Without public announcement of it, the acting general counsel, 27-year-old Frank Watson, gave up his post and went back to the RFC. Though no reason was advanced, it was generally understood that his liberal sentiments were not in complete accord with the policies espoused by the Administrator.

Changed Rules. Undisturbed by strife within and without, Deputy Administrator J. Howard Ardrey early last month issued the first printed regulations for operation of mortgage insurance under Title II. They contained few changes from the original set of rules handed out to the newspapers more than two months ago.

Two modifications affected mortgagees. Whereas the first rules insisted that mortgagees must be in business in towns with not less than 6,000 population, the present ruling is that they must be located in "trading areas embracing a contiguous population of not less than 6,000." Further the first set of rules required mortgagees to have a capital of $100,000 or more; the new set requires a "capital and surplus of not less than $100,000 of which at least $50,000 is unimpaired."

Administrator Ardrey also made two additions to his notes (see box).

Transactions Involving	Interest Rates[1]	Service Charge[2]	Mortgage Insurance Premium[2]
Acquisition and/or construction of, and/or refunding of temporary mortgage indebtedness against, property constructed after June 27, 1934	5% per annum	½% per annum	½% per annum
Creation of mortgage indebtedness (wherein neither acquisition, construction, nor refunding are involved) against property constructed before June 27, 1934	5½% per annum	½% per annum	1% per annum

[1] Upon monthly balances of unpaid principal
[2] Upon the original principal of the mortgage

In less legal language, the first establishes the rates for mortgages on which there had been temporary construction loans, and the second is the rate for houses built before passage of the act on which there had been no mortgage.

Two other bulletins were issued by FHA, one dealing with residential construction standards, and the other with insurance of mortgages on low cost housing.* (See The Architectual Forum, December, 1934, page 454.)

Field Men. By the middle of last month Administrator Ardrey had almost completed his field staff for the handling of mortgage insurance. Nearly 300 men were added to the payroll, as underwriters, valuators, mortgage examiners, reviewers, and architectural supervisors.

Each of the 60 officers was staffed with just enough men to handle the anticipated early applications, and to answer the hundreds of questions that perplexed potential borrowers and lenders are asking. The New York office, largest of all, had a chief underwriter, chief valuator, chief mortgage examiner, assistant chief underwriter, chief reviewer, senior staff valuator, underwriting examiner, an initial examiner, and an architectural supervisor. Other offices had only two or three to underwrite, valuate, examine, review, and supervise.

To these skeleton staffs as business picks up are to be added fee appraisers and fee architectural supervisors. But in all cases FHA employes will be required to attend school in Washington, there to learn from the departmental bosses the intricate routine of mutual mortgage insurance.

Another addition to FHA personnel was John R. B. Byers, named to handle insured mortgagees. Mr. Byers, well known to building and loan men as an efficiency expert, will first sell the plan to lending institutions and then keep them happy after they have been approved. By the middle of last month, approximately 175 institutions had signed up.

Amendments. Even when it was passed, the National Housing Act was not considered perfect by anyone. Now that the full import of some of its provisions is apparent, the clamor for changes is growing louder. Most vocal of those seeking modifications is the National Association of Real Estate Boards whose president-elect, Walter S. Schmidt, submitted to Messrs. Moffett and Ardrey a generous supply of amendments and interpretations that he believes would make the Act more workable.

The Schmidt proposals include: (1) The establishment of the same central mortgage discount bank for which NAREB has been plugging for five years; (2) leniency in the amortization provisions, at least permitting prepayment; (3) the carry-over of insurance on a mortgage when sold to an individual; (4) the establishment of a private servicor, that is, one who can be retained for the half per cent fee allowed by the Federal Housing Act to service a mortgage for any holder of an insured mortgage; (5) liberalization of the rules governing national mortgage associations, to permit them to engage in a reasonable amount of financing types of buildings not included in FHA rules, such as apartment houses, office buildings, theaters, factories, etc.

Subsidies. But the proposals suggested by Realtor Schmidt and others were not nearly so radical as one which is being given

*An explanatory bulletin on Titles II and III, published by *Time* and The Architectural Forum, is available to all Forum readers free. Copies in bulk five cents each. FHA publications may be obtained from any local FHA office, or from the Federal Housing Administration, Post Office Building, Washington, D. C.

serious consideration by the Housing Administration. The proposal is nothing more or less than direct subsidies to home builders involving an appropriation by Congress of $1,000,000,000. The subsidies, another name for outright gifts, would be limited to 20 per cent of the cost of labor and materials on any newly built houses. Under the plan, banks and lending institutions would make 80 per cent mortgages on the value of the land and building after deducting the government subsidy and the home owner would ante the remaining 20 per cent.

For example, a person owning a $500 lot and planning to build a $5,000 house would receive a grant of $1,000, or 20 per cent of the cost of the house, from the United States. After deducting the $1,000 the bank would lend on a mortgage 80 per cent of the remaining $4,500 or $3,600. Thus the builder's capital would be only $400.

Advocates of the plan envision an immediate $5,000,000,000 building program, which at a cost of $1,000,000,000 to the United States would more than pay for itself in the reduction of other forms of direct relief.

Title I. Despite the fact that Titles II and III were holding the spot-light, the repair and remodeling division of FHA was chugging along at a rate that was becoming steadily pleasing. In some sections of the country this phase of FHA was unquestionably successful while in others there had been no tangible results. The figures for the first fourteen weeks are as follows. They include only loans insured by FHA. Because of the 30-day lapse in reporting loans, the total is believed to be 15 per cent behind the actual number of loans made. Further surveys made by local FHA officials show that five cash dollars are being spent for repair and remodeling for every one dollar loaned through the FHA insurance plan.

	Number of Loans	Value
First week	117	$ 56,937
Second week	397	194,658
Third week	837	403,819
Fourth week	1,378	644,445
Fifth week	2,569	1,127,396
Sixth week	2,577	1,098,764
Seventh week	4,008	1,706,158
Eighth week	4,249	1,793,380
Ninth week	4,326	1,852,095
Tenth week	5,331	2,254,527
Eleventh week	5,635	2,359,382
Twelfth week	5,522	2,274,930
Thirteenth week	6,467	2,295,738
Fourteenth week	5,824	2,363,246
Total to date	49,237	$20,425,475

The most unbiased report of FHA repair and remodeling activity came from a Boston advertising agency, Wolcott and Holcomb, Inc., which summarized for its clients, after a nation-wide survey, these highlights: 1. Progress excellent after two months. 2. Banks cooperating 90 per cent. 3. Sixty-one per cent of all applications received are being approved by banks. 4. Only 60 per cent of the building industry is pushing the program aggressively. 5. Well-organized community campaigns inevitably bring results. 6. There is serious need for consistent house-to-house canvassing. 7. Two handicaps cited most frequently were: (a) the unwillingness or inability of the public to borrow, and (b) the lack of information to help home owners differentiate clearly between FHA, HOLC, PWA, etc.

Wolcott and Holcomb summarized their findings thus:

"This survey shows that the National Housing Act is moving ahead on all fronts. Next Spring should see repairing and remodeling under Title I well under way and new home building under Title II getting started as soon as grants can be obtained. It is too much to expect to jump back in a year to 1928 building figures, but the data obtained through country-wide surveys give every indication that the National Housing Act will make 1935 a banner year for the building industry."

AN ANCIENT INFIRMARY

gives place to a three-story garden apartment.

A UNIQUE lease signed last month in Manhattan made possible a three-story garden apartment house to occupy 54 per cent of a 41,000 sq. ft. plot just off Fifth Avenue, between 15th and 16th Streets. The district,

Once the World's Finest

New York's Old Chelsea, though somewhat undetermined in character, is by no means on a downward path. A clause in the lease gave away the fact that the apartment was being built as a "taxpayer," and seasoned real estate men rummaged through their

minds in vain to recall a similar transaction.

What was once the finest hospital building in the world, the old New York Hospital, vacated three years ago when the organization which it had sheltered since 1877 moved into New York's great white Cornell Medical Center, will be torn down to the top of its first story, and on its old walls what is perhaps to be the world's only apartment "taxpayer" will be built. Taxes, insurance and repairs on the hospital's empty rococo pavilions totaled practically $25,000 per year.

Involving a $250,000 mortgage to be contracted for by the hospital to cover the cost of building the "taxpayer," the deal gave George V. McPherson, a Brooklyn apartment builder, a sure five years, and a possible 21, in which to glean the profits which his ground rent, averaging only $16,000 a year, seemed sure to allow. The hospital figured on an average net income of $6,000 a year in arriving at this rental.

Mr. McPherson, who will raze the old hospital and build the three-story apartments on its foundations, undertakes, in this, his first Manhattan building operation. In Brooklyn he has built a number of apartment houses, which he manages and maintains himself. Joseph Martine and George G. Miller, Manhattan architects, have drawn the plans for the new structures, which will surround a central court 100 x 118 feet. The bottom sill of the first-floor windows will be at least nine feet from the street level, to insure privacy. The facades of the buildings will be of stucco and half timber, and will be English Tudor in design. Living rooms will have textured walls and oak beamed ceilings.

Builder McPherson stood a good chance of making a profit from his building activities. Expecting a full tenancy, Lessee McPherson had his first year's profits figured as follows:

INCOME:	Per Month	
26 — 2 room apartments @	$50.00	$1,300.00
26 — 2 room apartments @	$55.00	1,430.00
15 — 3 room apartments @	$75.00	1,125.00
15 — 3 room apartments @	$80.00	1,200.00
6 — 4 room apartments @	$100.00	600.00
6 — 4 room apartments @	$125.00	750.00
Estimated Monthly Rental		$6,405.00
Estimated Annual Income		$76,860.00

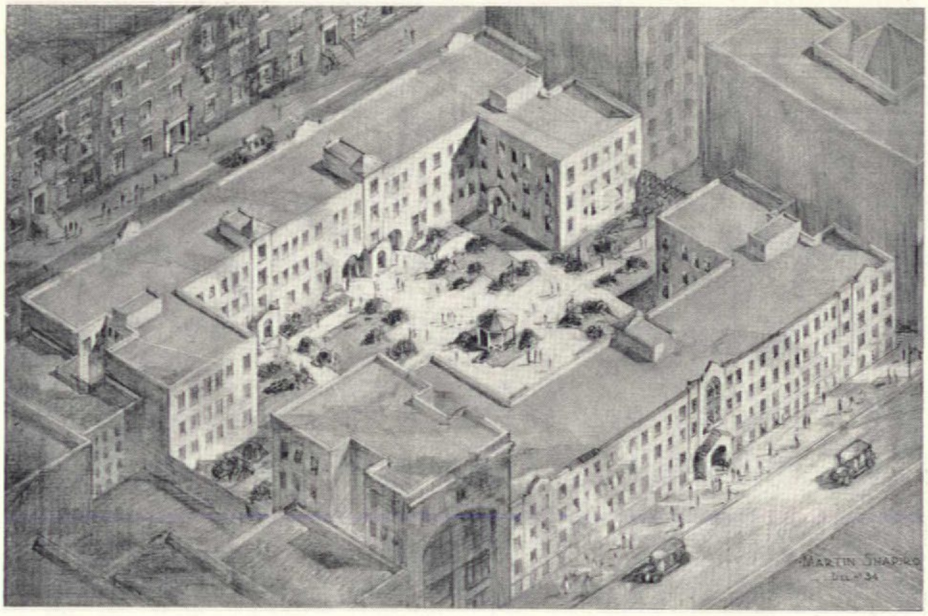
CARRYING CHARGES:	
Superintendent's salary	1,200.00
3 Porters	2,160.00
Electricity	420.00
Renting commissions — estimated	600.00
Advertising	1,200.00
Legal and accounting expenses	100.00
Telephone	75.00
Hardware and maintenance supplies	235.00
Repairs	130.00
Insurance (fire, liability and compensation)	550.00
Painting and decorating labor	500.00
Painting and decorating material	330.00
Coal — estimated	1,796.85
Miscellaneous expenses	500.00
Water	705.00
	$10,501.85

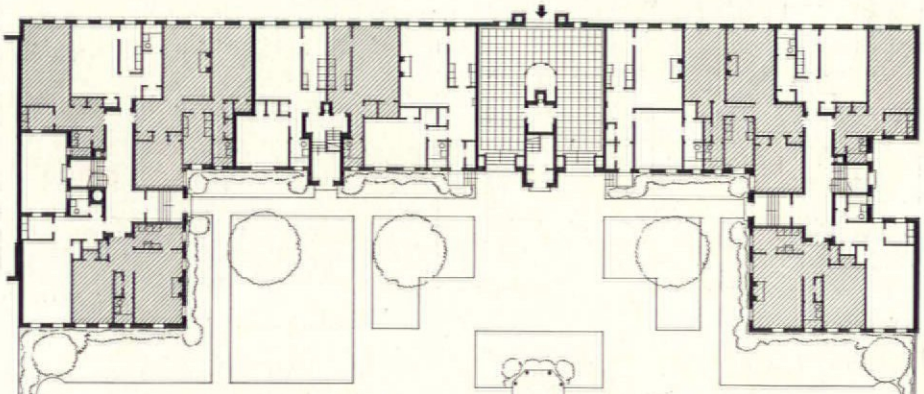
FIXED CHARGES:	
Taxes	$19,475.00
Ground rent	10,000.00
Interest on first mortgage	13,750.00
Amortization	5,000.00
Total Fixed Charges	$48,225.00

ESTIMATED ANNUAL PROFIT: $18,133.15

Although his interest charges will decrease as time goes on, due to amortization, and although Lessee McPherson's hopes that rents will shortly go up may well come true, his profits will inevitably decrease, for his ground rent graduates to $19,000 over the life of the lease. Barring unforeseen circumstances, however, they should always bring Mr. McPherson a good return on his money.

A foreseen circumstance was that after five years the hospital, with its mortgage theoretically almost repaid through McPherson's rent ($80,000) and amortization ($25,000) payments plus savings made on upkeep and taxes ($125,000), might dispossess its tenant and sell the big plot at a killing. This possibility will become more acute if, as is likely, the district stabilizes into residences.





1's, 2's and 3's, with Sunshine and Greenery

MODERNITY'S FIRST SUBDIVISION

gets its first house, but not without a pitched battle with labor which threatens to disrupt it.

It has become a commonplace in New York City real estate circles to say that the first man to promote a modern home subdivision within commuting distance of the city will make a pot of money. Many a scheme has reached the mixing stage but none has been ready to bake.

Two months ago it seemed very likely that on the first Sunday in April or thereabouts the real estate sections of the city's newspapers would be carrying an advertisement headlined:

LONG ISLAND'S FIRST MODERN HOME DEVELOPMENT READY FOR YOUR INSPECTION

Today the chances are growing slimmer and slimmer. But if such an advertisement does appear, it will bear the signature of Hempstead State Park Homes, Inc. An ultra-modern model house is built, a plot plan is ready for the 1,045,000 sq. ft. surrounding it, and H. Arthur Colen, Hempstead's president, has an option to buy all of it.

Whether he will exercise his option or not, and whether he will be the first to make a bid for the pot of money, only Mr. Colen knows. For the plans he laid have shown definite signs of going *agley*.

Arthur Colen has not always believed in modern architecture. Brought up in the speculative school of Long Island, he, along with his colleagues, held the notion that "nobody would ever buy those boxes." Instead, he preferred to build the tricky houses that have, in times past, sold like griddle cakes for prices ranging from $4,990 to $12,750.

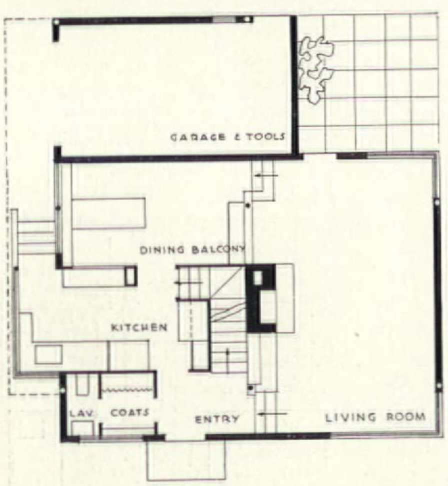
Back in October, 1933, speculator Colen dropped in at an exhibition of modern architecture. A little bit doubtful as to the salability of what he saw, he nevertheless was intrigued enough to send an agent to one of the exhibiting architects, Percival Goodman. It was a rare meeting.

Though New York born, Architect Goodman had never met a speculative builder before. Winner of the highly coveted Paris prize in 1925, he had spent three years at the Ecole des Beaux Arts. When he returned to New York, instead of carrying along the Beaux Arts traditions, he had seen enough of European internationalists to know that modern architecture and not traditionalism was to be his metier. To Colen's agent, Architect Goodman explained the theories upon which modernism is built. A facile talker, he convinced the agent and later Colen, that it would pay to be bullish on modern design.

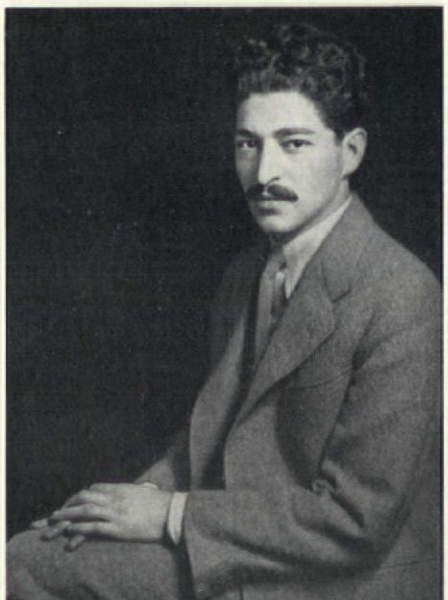
One thing Mr. Colen lacked — money, but the same lack had confronted him before and he had always been able to find a backer. Because he could not argue the fine points of modern design, he took Architect Goodman with him on his calls to bankers. From all save a Jamaica lending institution they received a cordial but final "no." The Jamaica bank promised to finance the model house, to watch its construction and to put its lending stethoscope on the public's buying pulse.

Mr. Colen thought he would like to split up his acreage into 20-foot lots, but as gen-

(*Continued on Page 28*)

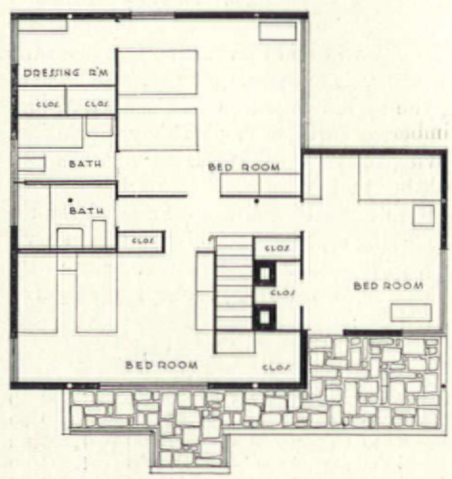


First Floor

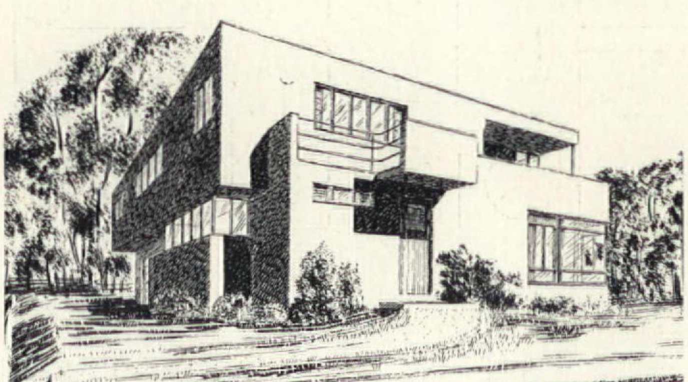


Kaiden Studios

Architect Goodman



Second Floor



As Projected

As Built

MODERN SCHOOL HEATING EQUIPMENT

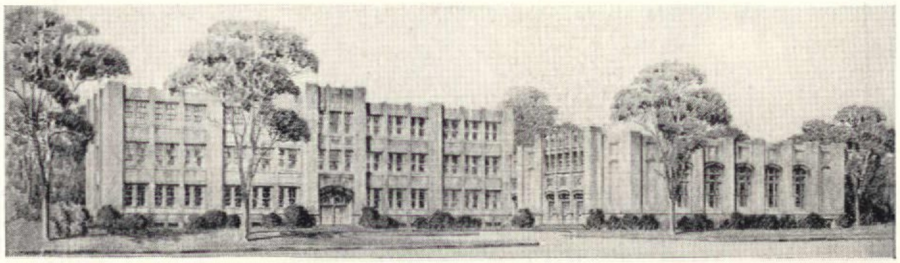
WITH RECORDS OF PROVEN PERFORMANCE

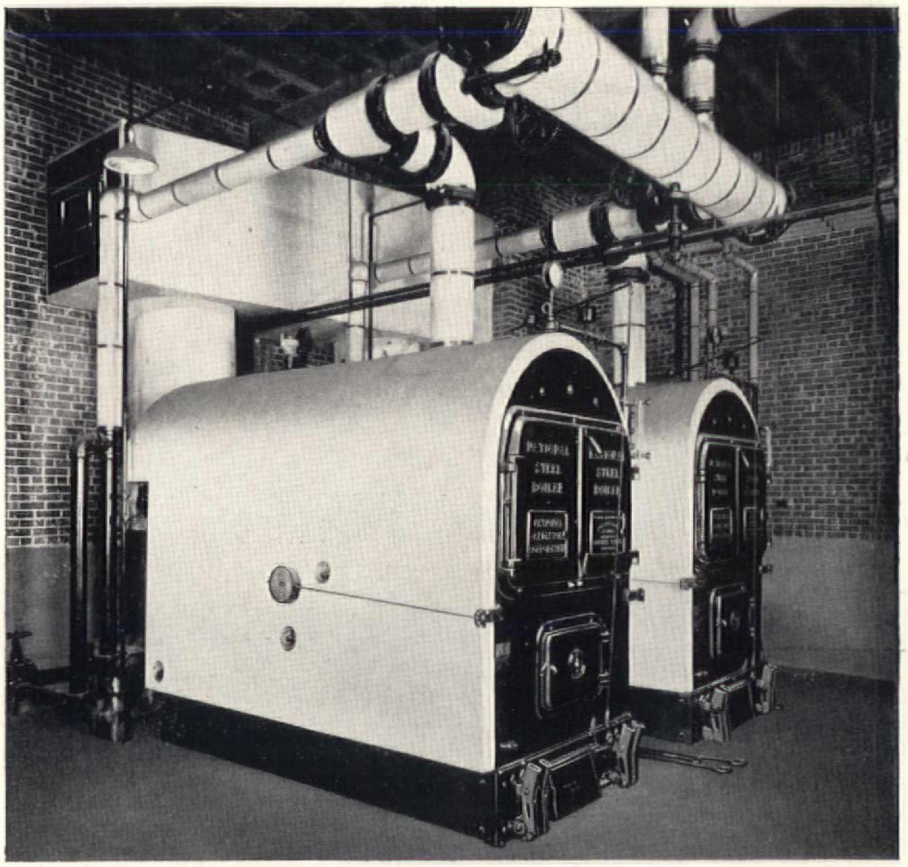
NATIONAL-PREMIER STEEL BOILERS CUT SCHOOL HEATING COSTS TO NEW LOWS

School Boards, harassed by tax-payer pressure to reduce school budgets, welcome every opportunity to reduce expense. The National-Premier Steel Boiler has won a wide welcome because of its demonstrated ability to cut heating costs. On new and replacement jobs, National-Premier Boilers are warming school buildings of all sizes and types, over the country.

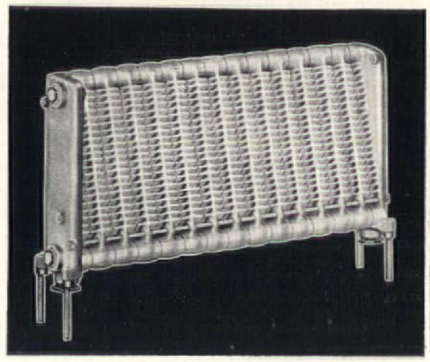
Of advanced design, the compact, durable National-Premier offers economy features found in no other single boiler. Its flush front saves space. Its smoke chamber is water-jacketed on five sides, converting a heat WASTING feature of current design into a heat GENERATING feature. The water-cooled detachable steel bridge-wall eliminates a common maintenance expense, adds flexibility. A specially designed heat resisting arch, to preheat and introduce secondary air, is provided in smokeless type boilers.

The comments of users give the best picture of the service and economy of the National-Premier Steel Boiler. May we send you some from our files?





AERO CONVECTOR'S LIFE-TIME PERMANENCE WINS SCHOOL-BOARD FAVOR



Concealed heating expands available space in existing school-rooms, gives more usable space in new construction. But it makes COMPLETE dependability in the heating unit imperative.

Cast Iron's permanence, its resistance to corrosion, is too well known to require comment. The Aero Convector, 100% Cast Iron construction, inherits the metal's life-time properties. The design of the unit assures the delivery of warmth to living zone rather than ceiling; trouble-free operation in all weathers; and the permanent maintenance of output. Full details of the features which make the Aero Convector ideal for schools, plus reports on service in schools and elsewhere, will be furnished on request.

A FEW TYPICAL SCHOOL AND COLLEGE INSTALLATIONS

National-Premier Steel Boilers

Woodlawn Avenue School, Munhall, Pa.
(illustrated at left)
Adam G. Wickerham, Homestead, Pa.
Architect and Engineer

Melrose High School, Melrose, Mass.
Architect: J. Wm. Beal Sons, Boston
Engineer: A. B. Franklin, Boston

Blythe Township School, New Philadelphia, Pa.
Architect: Adam Frank, Tamaqua, Pa.
Engineer: Frank Ross, Wilkes Barre, Pa.

School No. 101, Baltimore, Md.
Architect: Bernard Evander, Baltimore
Engineers: Henry Adams, Inc., Baltimore

National Aero Convectors

Consolidated High and Grade School, Greenville, Me.
Architect: C. R. Whitcher, Manchester, N. H.

Principia College, Elsah, Ill.
Architect: Maybeck & White, San Francisco, Cal.
Engineer: George E. Wells, Inc., St. Louis, Mo.

Deerfield Township High School, Lake Forest, Ill.
Architect: Anderson & Ticknow, Lake Forest, Ill.
Engineer: Office of Hollis French, Boston, Mass.

Harvard University, Cambridge, Mass.
Architect: Coolidge, Shepley, Bullfinch & Abbott, Boston

NATIONAL RADIATOR CORPORATION

GENERAL OFFICES: JOHNSTOWN, PA. . . . BRANCH OFFICES IN PRINCIPAL CITIES

tly and as conclusively as he could, Goodman disabused him of the notion that modern houses could be built row on row. It was then decided to build complete detached houses on 40-foot lots, making 140 houses in all. To Architect Goodman, the opportunity which lay before him pumped more energy and enthusiasm through his system than the winning of the Paris prize. To consult with him on construction, he retained one of the nation's ablest reenforced concrete engineers, Dr. Jacob Feld.

Together, Goodman and Feld decided to build the model house and all the other 139 houses of reenforced concrete. Sound economy could be effected by reusing the forms, and ample sand and gravel were available from the property. Preliminary building costs estimates indicated probable cost of \$3,500 per house: \$1,500 for excavation, foundations, the shell of the house and the stairs, and as much as Mr. Colen wanted to spend on finishing and equipping the house. For a selling price, Mr. Colen thought he could do a quick business at between \$8,000 to \$9,000 including the land, with a down payment of \$2,000 and first and second financing to meet the buyer's need.

So matters stood until construction began. And then befell a series of major and minor calamities that lasted until the house was finished.

Only Architect Goodman can describe what happened: "The fact that a cantilever could be built was a great shock and surprise to the concrete men. (It was impossible to get a large reenforced cement company to tackle a small job of this type.) The plumber, who had considerable experience in small house work, was completely at a loss. He had only installed plumbing in wooden houses and did not have the vaguest idea of what should be done in this type of house. It was necessary for us to make special drawings describing exact locations for all piping, etc. Drawings were made giving full details of all important conditions. Our specifications were very complete for a house of this type.

"We discovered that the type of contractor employed on Long Island inexpensive housing projects had never seen specifications or dreamed of details. We found that beyond a knowledge of the horizontal location of a window, they did not understand the plans. When we showed windows 3 ft. 6 in. from the floor, they proceeded to install frames for these windows at the usual 2 ft. 2 in. When the section showed clearly a parapet of bookcase separating two rooms, they proceeded to build walls because walls were the only separation between rooms that they had ever heard of. When an electric outlet was clearly shown off the center of the wall, the electrician put it on dead center. In short, the plans had very little meaning to them.

"Apparently, to them there are hieratic methods of construction and any departure from them is an offense against God."

The project was started about the first of June and allowing time for the unfamiliarity of the workmen, errors and the like, it was to have been finished between July 15 and Labor Day. The work was not completed until the first of November.

In the course of construction, it was necessary to condemn the first tier of concrete and have it torn down because Colen, who acted as general contractor, and the concrete subcontractor thought the specifications called for too much reenforcing and had poured the floor before engineer Feld investigated the placing and quantity of the reenforcing.

"Mr. Colen supervised the job himself. He maintained that when an architect spoke to a contractor, the bids were always much higher. We discovered that many of the contracts were given out without the contractor having an opportunity for a careful study of the plans and specifications. For this reason, they were amazed when the architect appeared on the job and gave them instructions. They had never seen an architect on a job. When the specifications were quoted, they said they knew nothing of specifications; they had never seen any."

By the time the house was completed, quarrels between architect and builder were almost daily affairs. Mr. Goodman sometimes wonders how the house was ever finished at all. Certainly there will be no others of his design.

Now the house stands waiting for the Spring buying season. Both architect and engineer disown it. Hempstead State Park Homes, Inc., has closed its office on Fifth Avenue, but it may reopen again.

Though the house was completed to the satisfaction of no one, one question still remains unanswered: What will the public think? More people than Mr. Colen and the Jamaica lending institution would like to know. Every home builder in the city is waiting to learn the verdict, and all are wishing that the first modern home development in the New York area could have been launched more favorably.

LABOR'S TWO-HEADED

building department prepares for grave disputes.

While the Post Office and Interior Department buildings were bursting with plans for a big building year in 1935, the old building which houses the American Federation of Labor was harboring a fight that may tear all those plans to pieces. For at last the Building Trades Department squabble had come to a head.

As ordered by the A. F. of L. executive council at its San Francisco convention last fall, a meeting was called in November to elect new officers of the Building Trades Department. To the meeting came delegates of seven unions — carpenters, bricklayers, electricians, marble workers, teamsters, hod-carriers, and hoisting engineers. To the meeting did not come delegates from the twelve other unions in the department, nor did Michael J. McDonough, head of the department, who was upstairs in his office, attend. So far as he and the twelve unions were concerned, there was no cause for the meeting. They had elected officers in San Francisco.

But A. F. of L. President William Green had ruled out the San Francisco election because three of the seven unions (carpenters, bricklayers, electricians) had been excluded. Last June the three unions (the Triple Alliance), which had withdrawn from the department a few years ago, applied for reinstatement. But President McDonough returned their dues to them.

Behind it all lay the desire to control the Department — for under the NRA, the Department, through its representation on the Planning and Adjustment Board, is to have a powerful voice in the settling of jurisdictional disputes between unions. (See The Architectural Forum, November, 1934, p. 379).

McDonough's refusal to reinstate the Triple Alliance grew out of the certain knowledge that they controlled enough votes (500,000) to throw him out of office. And that is exactly what happened when the meeting was held late in December. William J. Williams of the Carpenters Union was elected president.

But instead of leaving office, McDonough refused to budge, refused to give up the department's books or its cash. Declared he: "We do not intend to recognize any decision made at the convention held at the Federation's headquarters."

So today the A. F. of L. has two Building Trades Departments, one old and one new, both occupying space in the same building. Interpreting subsequent events for readers of the New York *Times*, well-posted labor correspondent Louis Stark reported:

"The internecine rivalry will be carried on in sharp jurisdictional struggles between members of both groups and the new Federal housing program is expected to be affected. The fight will be carried to the local building trades councils in cities all over the United States.

If, as has been proposed, the controversy is taken to the executive council of the A. F. of L. even more serious consequences are anticipated. Such a step, predicted Reporter Stark, "would precipitate an immediate coalition of forces in the parent body and all the 100 international unions would have to line up and take sides. In such an eventuality, labor observers fear that the Federation would split into two organizations, with a crippling of the entire labor movement resulting."

Probably labor's saner heads will forestall such drastic action, but whether they do or not, it is freely predicted by competent observers that the year 1935 will go down in labor history as one of bitter jurisdictional striking.

SPECIFY STREAMLINED IVORY SOAP DISPENSERS

in your next school project

The school washroom is today coming in for its just share of attention. And to be truly modern, its washing facilities must include attractive, efficient soap dispensers.

The new streamlined Ivory Soap Dispenser is admirably suited for modern school washroom installations. Here is the perfect combination of beauty and utility. The lines are graceful and in good taste. All metal surfaces are heavily chromium plated. Mechanically it is faultless.

Each Ivory Dispenser is a self-contained soap dispensing unit. It has no complicated piping system to clog or get out of order. It is easy to install. It delivers a measured amount of flaked or granulated Ivory Soap at each push of the plunger—*and it always delivers!*

Ivory Dispensers are low in first cost and in up-keep. They place no burden on restricted school budgets.

Write these attractive, efficient, economical dispensers into the specifications of your next school project. For complete construction details, consult Sweet's Catalogue. Quantity prices upon request.

Procter & Gamble, Cincinnati, Ohio

IVORY SOAP DISPENSERS

ABSORBEX

FOR ACOUSTICAL TREATMENT

ASSEMBLY ROOMS

CLASS ROOMS

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CORRIDORS

&

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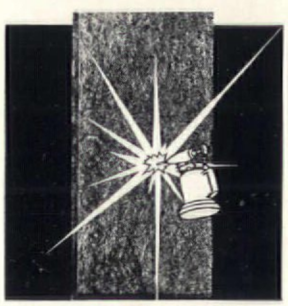


THE FIRE-PROOFING INSULATION

FOR THERMAL INSULATION AND ACOUSTICAL TREATMENT

ROOF DECKS

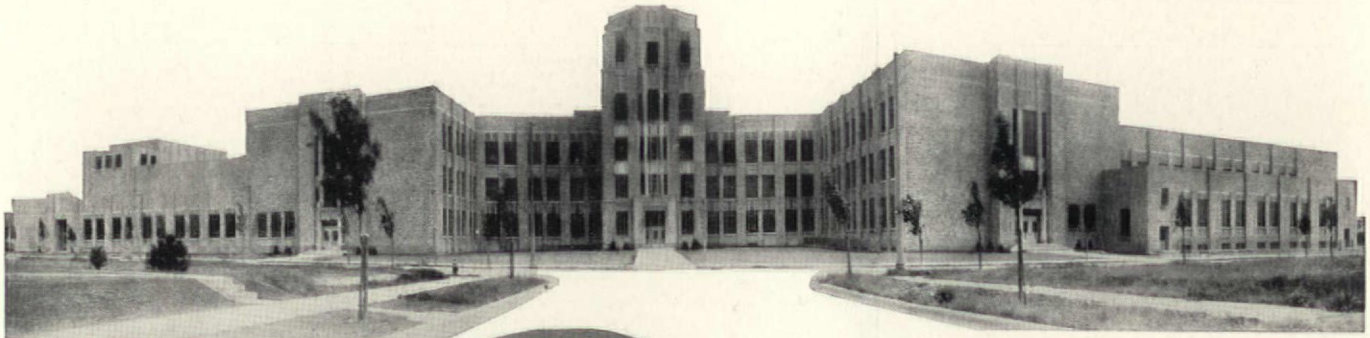
PARTITIONS

WALLS

HERMAX, FARMERS BANK BUILDING, PITTSBURGH, PENNA.

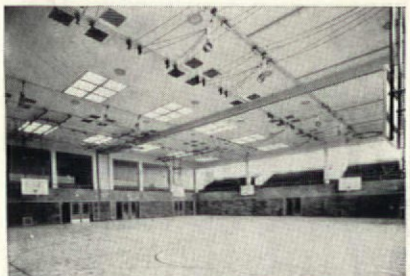
LITERATURE ON REQUEST

Efficiency is only *half* the story when it comes to choosing an *acoustical material* for schools!



RUFUS KING HIGH SCHOOL *recently constructed in Milwaukee. Guy E. Wiley, head of the school board's Architectural Department, selected Armstrong's acoustical products for installation in eleven different places in this fine new school.*

ARCHITECTS SPECIFY ARMSTRONG'S CORKOUSTIC BECAUSE IT OFFERS THESE IMPORTANT *extra* ADVANTAGES—
Attractive interior finish
Ease and economy of maintenance
Durability



GYMNASIUM *clatter and noise are quieted with an attractive ceiling of Armstrong's Corkoustic. This popular material also provides valuable heat insulation.*

LIBRARY. *No scraping of chairs or buzzing of voices disturbs the quiet of this room. An Armstrong's acoustical product has been applied to the ceiling, Armstrong's Cork Tile to the floor.*

MUSIC ROOM. *The high sound absorption efficiency of Armstrong's Corkoustic is used in this room to provide necessary acoustical correction.*

ARMSTRONG'S Corkoustic has high sound absorption efficiency—and more! It has those vital features of architectural correctness and practicality that make it unmatched among acoustical materials for application in schools, and for every other type of public and private building.

For eleven different places requiring noise-quieting and acoustical correction in Milwaukee's new Rufus King High School, Architect Guy E. Wiley chose Armstrong's acoustical products.

You'll find that Armstrong's Corkoustic offers almost endless opportunities for distinctive, pleasing wall and ceiling treatment to harmonize with any interior scheme.

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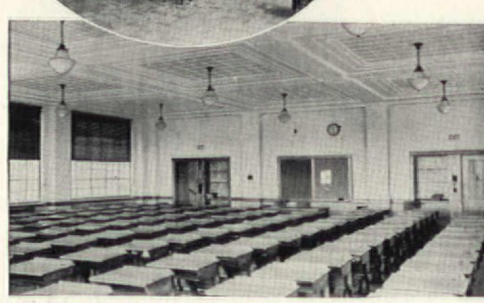

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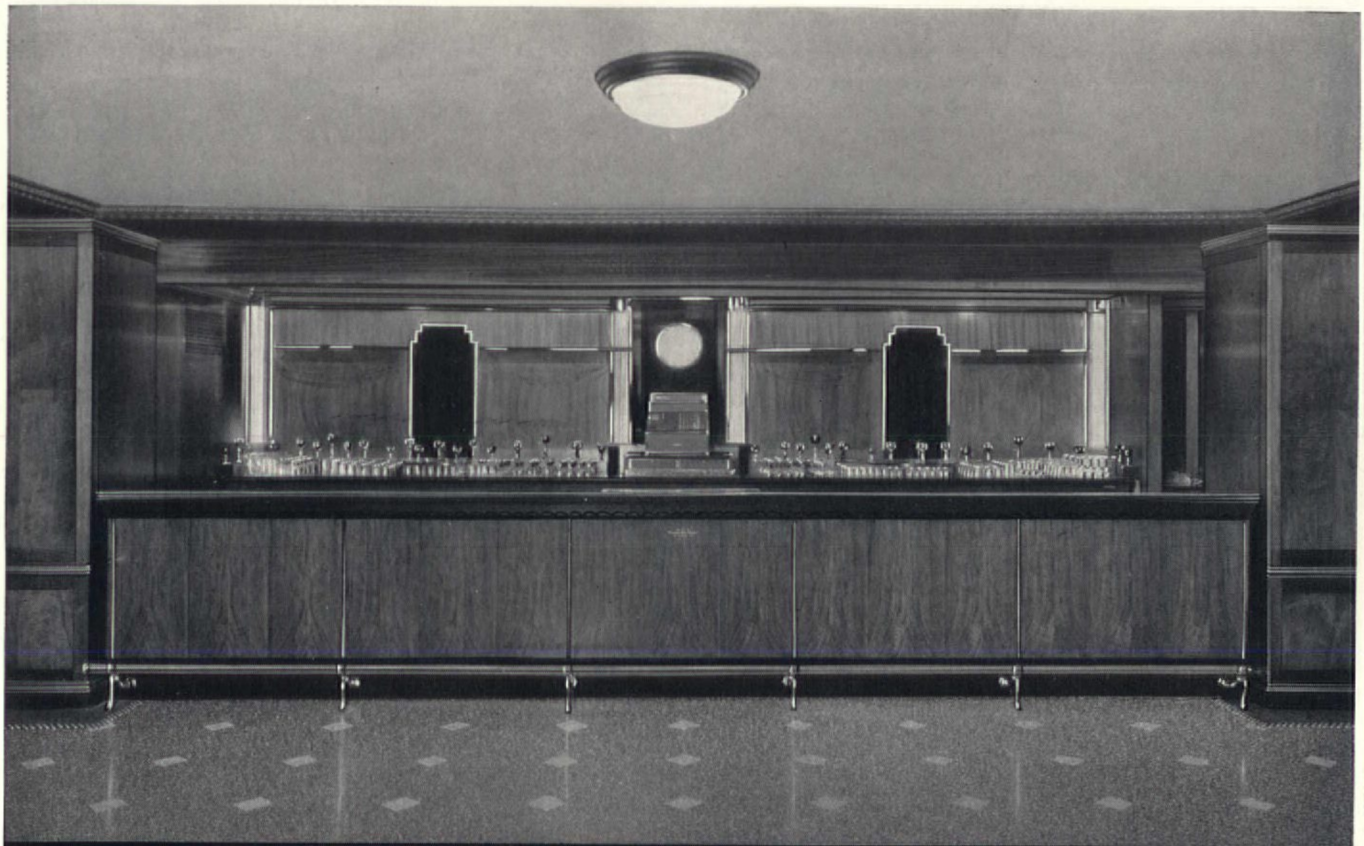

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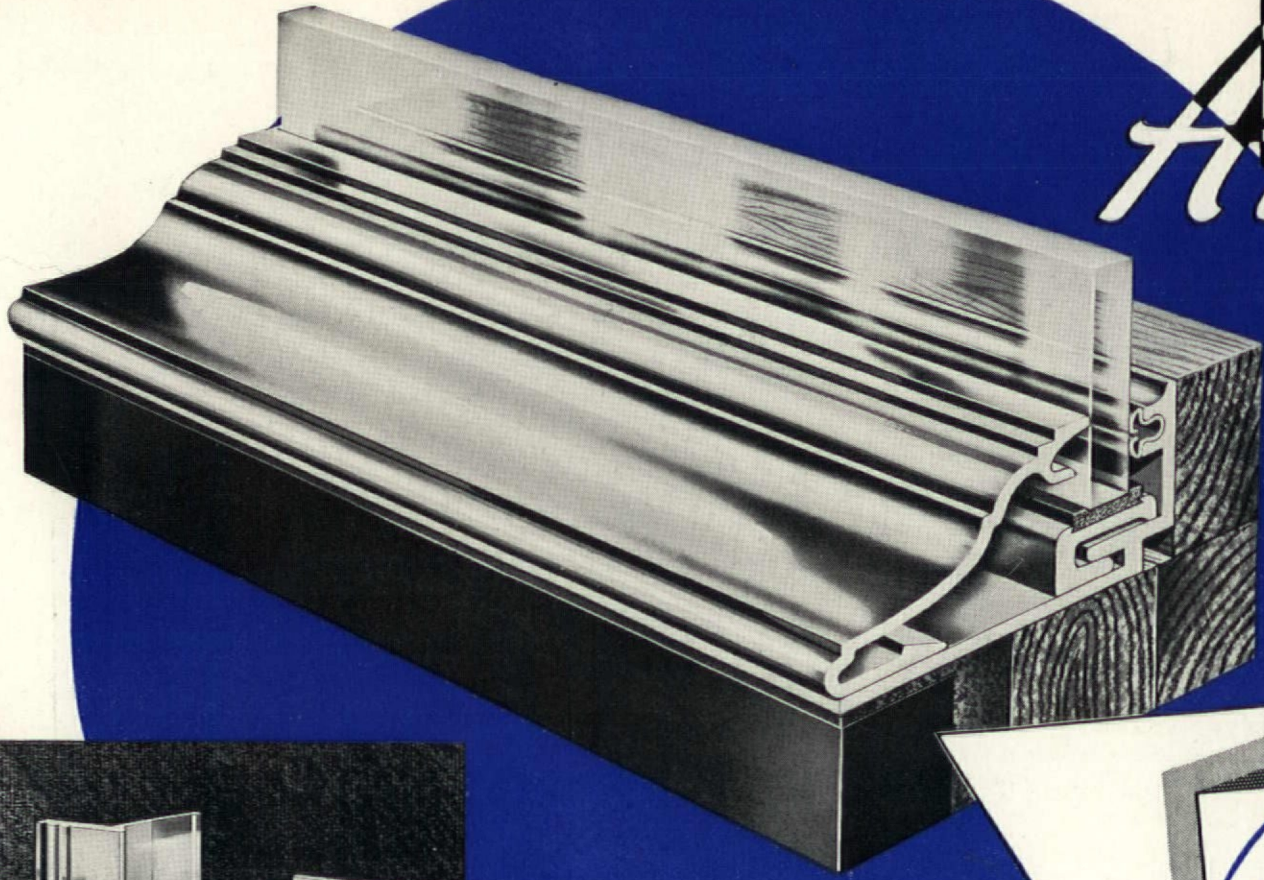

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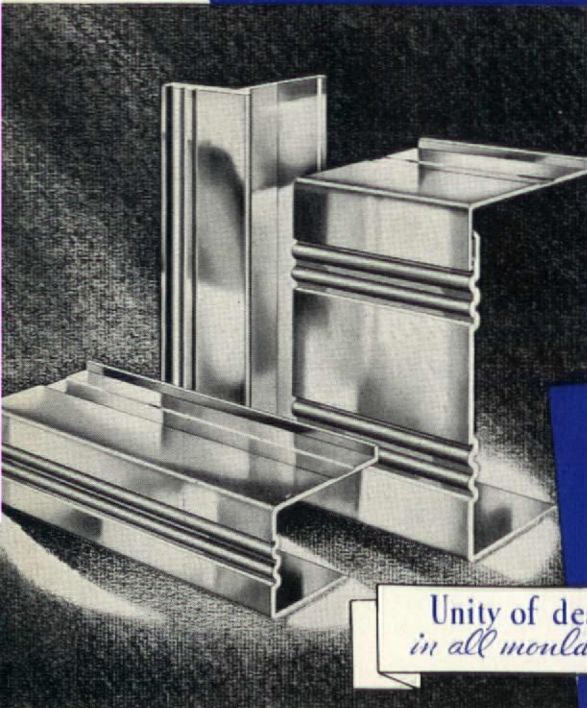
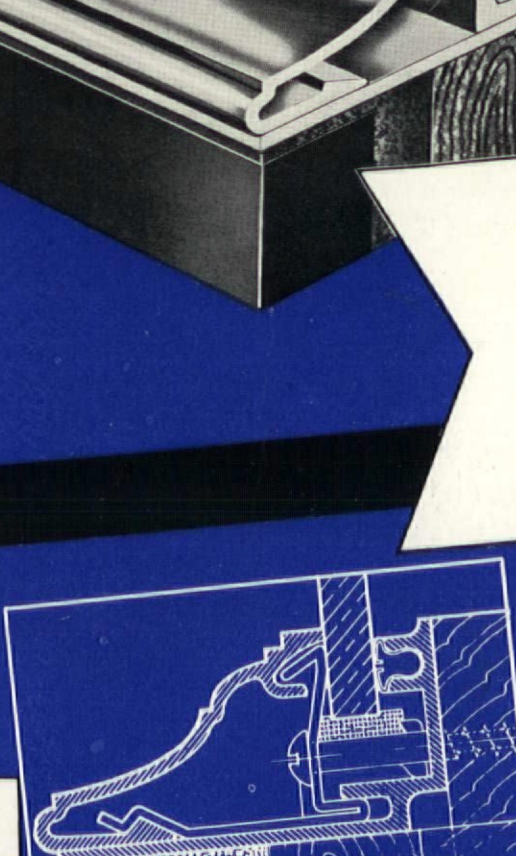


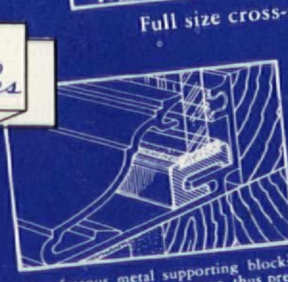
Unity of design in all mouldings

Trim Vertical Bars adjustable to all angles



Full size cross-section of Pittco Sash.

The metal surfaces which contact the sides of glass act as a yielding cushion, absorbing dangerous shocks and jars.

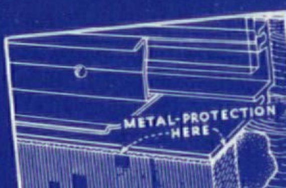


Non-ferrous metal supporting blocks are firmly wedged in groove, thus preventing tipping, rocking or sliding out of line during setting of glass.

Heavy metal cleats seated in groove at corners secure miters against rising, falling or spreading due to faulty frame work.

Glass-holding units and face members are self-adjusting to various glass thicknesses without tilting inward or outward.

A metal blade inserted in each end of face and locked by pin to rear member is an extra means of securing face in position.



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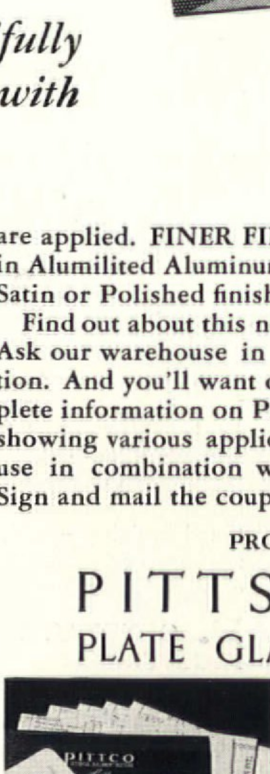

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BOOKS

A Bibliography of Books and Magazine Articles on the Planning, Construction, and Equipment of Schools of all sorts in the United States and Europe.

A. GENERAL PLANNING—COLLECTED EXAMPLES—BOOKS.

1. SCHOOL ARCHITECTURE, Principles and Practices, by John J. Donovan, 1921, 724 pp., ill., bibl., Macmillan, New York.

Still full of valuable data for the modern school. Chapters on: Sites and grounds — Architectural planning and construction — Landscape development — Costs — Organization of elementary schools, intermediate, high schools — Vocational schools — Hygiene of schools — Physical education — Administration offices — Classrooms — Kindergartens — Libraries — Corridors, stairs, entrances — Assembly hall — Music department — Physics and chemistry — General science and biology labs. — Commercial department — Drawing department — Industrial arts — Home economics — Cafeterias — Heating and ventilating — Plumbing — Electrical installation and illumination — Standards of school planning.

2. A METHOD OF PROCEDURE AND CHECKING SCHEDULE FOR PLANNING SCHOOL BUILDINGS AND THEIR EQUIPMENT, by John J. Donovan, 1932, 361 pp., ill., Bruce Publishing Co., New York.

A most complete outline of data in check list and note form. Up-to-date.

3. SCHOOL BUILDINGS OF TODAY AND TOMORROW, by W. K. Harrison and C. E. Dobbin, 1931, 233 pp., ill., Architectural Book Publishing Co., New York.

A stimulating collection of projects and executed work. Much data in text and drawings. Part I: Design of the Modern School, Part II: Modern Foreign Schools, 29 pp. Part III: Standardization of School Building Types and Details.

4. PLANNING SCHOOL BUILDING PROGRAMS, by N. L. Engelhardt and F. Engelhardt, 1930, 574 pp., ill., Teachers College, Columbia University, New York.

Principally for school administrators but includes data of interest to architects. Sections on: Population — Site selection — Size and form — Planning — Landscaping — Building utilization — Standards — Relations with architect — with contractors — Costs — Cost of sites — Financing — Publicity — Surveys.

5. STANDARDS FOR ELEMENTARY SCHOOL BUILDINGS, by G. D. Strayer and N. L. Engelhardt, 1933, 181 pp., bibl., Teachers College, Columbia University, New York.

Recommended practice on following: Site — Building — Service systems — General classrooms — Kindergartens — Special activity rooms — General service — Administration.

6. STANDARDS FOR JUNIOR HIGH SCHOOL BUILDINGS, by N. L. Engelhardt, 1932, 161 pp., diagrams, bibl., Teachers College Columbia University, New York.

Similar to A—5. Full and concise data on standard practice.

7. CHECK LIST MATERIALS FOR PUBLIC SCHOOL BUILDING SPECIFICATIONS, by Lee Byrne, 1931, 195 pp., lists, tables, Teachers College, Columbia University, New York.

Intensive analysis and development of working check list.

8. SAFEGUARDING THE SCHOOL BOARD'S PURCHASE OF ARCHITECT'S WORKING DRAWINGS, by A. M. Proctor, 1931, 138 pp., ill., bibl., Teachers College, Columbia University, New York.

Advocates State supervision and checking of architectural service. Chapter III: Defects in architects' working drawings, on basis of completeness and clearness. Check list for working drawings, 20 pp. Suggested State requirements. Excerpts from various State laws and regulations.

9. SOME CODE CONTROLS OF SCHOOL BUILDING CONSTRUCTION IN AMERICAN CITIES, by J. W. Sahlstrom, 1933, 153 pp., ill., bibl., Teachers College, Columbia University, New York.

Part III: Code requirements for fire resistance in school buildings. Part IV: Requirements for stairways, fire-escapes, bearing walls, live floor loads and sanitation. Part V: Conclusions and recommendations.

10. ECOLES, by Roger Poulain, 1930, 104 plates in portfolio. Vincent Freal, et cie., Paris.

Very clear plans and photo-views of twenty European schools and projects. Paris building code for schools.

11. BAUTEN DER VOLKSERZIEHUNG UND VOLKSGESUNDHEIT, by J. E. Margold, ed., 1930, 362 pp., ill., Ernst Pollak Verlag, Berlin-Charlottenburg.

Over 100 pp. clean-cut modern schools from Europe and America. Some projects. Also includes construction for athletic and health purposes.

12. DER NEUE SCHULBAU IM IN— UND AUSLAND, BY JULIUS VISCHER, 1931, 100 pp., 310 ill., bibl., J. Hoffmann, Stuttgart.

Short text on the following aspects of the modern school: health — open air — vocational training — equipment — special rooms — costs. Illustrations and plans of examples from Europe and America, 50 pp.

B. GENERAL PLANNING — PERIODICALS.

1. Architectural Forum, v. 55, Dec., 1931, School Reference Number, pp. 637-774, 2 parts.

2. Architectural Record, v. 69, May, 1931, pp. 389-409, 427-442.

3. L'Architecture d'Aujourd'hui, Paris. v. 5, ser. 4, No. 4, May, 1934.

4. Arkitekten Maanedshaefte, Copenhagen, v. 35, Jan.-Feb., 1933.

5. Der Baumeister, Munich, v. 28-Dec., 1930, v. 30, Nov., 1932.

6. Byggmastaren, Stockholm, Feb. 10, 1932, No. 5 (Arkitekt upplagen No. 2).

7. Moderne Bouwkunst in Nederland, Rotterdam, 1932-33, Nos. 13 and 14; 1934, No. 12.

8. Rassegna di Architettura, Milan, v. 6, Aug.-Sep., 1934, pp. 319-362.

9. Monatshefte für Baukunst und Städtebau, Berlin (formerly Wasmuths), v. 16, June, 1932, pp. 257-284.

10. Das Werk, Zurich, v. 19, May, 1932, No. 5.

C. GENERAL PLANNING—ARTICLES.

ARCHITECTURAL FORUM:

1. Modern Ideas for Modern Schools, by N. L. Engelhardt, v. 55, Dec., 1931, pp. 637-643, ill., plans. Intermediate, junior and senior high schools.

2. Planning for Multiple Use, J. O. Betelle, v. 55, Dec., 1931, pp. 644-648, ill., plans. Platoon system increases capacity. Community use.

3. An Analysis of School Planning, A. B. Moehlman, v. 55, Dec., 1931, pp. 683-692, plans. Comparative efficiency of plan types.

4. Ideas from European schools, F. J. Woodbridge, v. 55, Dec., 1931, pp. 725-730, ill., plans. Orientation — plan — composition — materials — simplicity. Nine schools described.

5. Check list for school buildings, v. 55, Dec., 1931, pp. 772-774.

6. New Day Elementary Schools, by J. H. Callender, v. 59, Dec., 1933, pp. 479-486, ill., plans. Data on educational, recreational, administration departments and services.

ARCHITECTURAL RECORD:

7. Development of Junior High Schools in Chicago, by R. W. Yardley, v. 69, May, 1931, pp. 435-442, ill., plans. Size — curriculum — departments — construction.

8. Unit Construction in School Planning, by W. S. Holmes, v. 70, Dec., 1931, pp. 389-400, ill., plans. (Typical use of unit plan.)

9. Schools —Planning for Efficiency and Economy, by E. B. Cassell, v. 72, Aug., 1932, pp. 138-144, ill., drawings. Classrooms — gyms. — cafeterias — toilets.

OTHER PERIODICALS:

10. Trends in School Planning, by N. L. Engelhardt, American Architect, v. 144, Mar., 1934, pp. 10-21, ill., plans. Activity program — site — adult education.

11. The Trend in School Building Design, by J. O. Betelle, Architecture, v. 65, May, 1932, pp. 249-252, ill., plans. Innovations in planning and use.

12. The English Public School Plan and the New Merchant Taylors School, by W. G. Newton, Royal Institute of British Architects Journal, ser. 3, v. 41, June 2, 1934, pp. 729-746, ill., plans. A review of 60 years' progress.


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13. Orientation of School Buildings, Royal Institute of British Architects Journal, ser. 3, v. 39, Sept. 10, 1934, pp. 791-4, drawings.

14. Educational Buildings, Their Relation to the Town Plan, Part I, W. Dougill, Town Planning Review, v. 16, July, 1934, pp. 1-15.

15. L'école Active et L'école du Travail, E. Decroix, L'Architect, Paris, Nov.-Dec., 1933, pp. 144-156, pl. 67-72, ill., plans. International comparison of activity and vocational types.

16. General articles in Danish:

Arkitekten Maanedshaefte, v. 33, Oct., 1931, pp. 205-216, ill., plans.

Tilskueren, Sept., 1931, pp. 161-168, ill., plans.

PROFESSIONAL RELATIONS AND LEGISLATION:

1. Owner — The Board of Education, by N. M. Dunning, Architectural Forum, v. 55, Dec., 1931, pp. 769-771, Part II.

2. From Experience with School Building Committees, by J. J. Donovan, Architectural Forum, v. 55, Dec., 1931, pp. 691-692.

3. Professional Relations Between Architect and School Board, by J. J. Donovan, Architect and Engineer, v. 105, Apr., 1931, pp. 58-63.

4. California earthquake legislation, discussions: Architect and Engineer, v. 113, Apr., 1933, pp. 59-60; May, 1933, pp. 59-60; v. 114, Sept., 1933, p. 75; v. 117, May, 1934, pp. 48-51; June, 1934, pp. 53-54.

D. SPECIAL PLANNING AND DATA—BOOKS.

A. Educational

1. Planning the School Library, Library Bureau, Division of Remington-Rand, Inc.

B. Recreational

1. Rural Schoolhouses, School Grounds and Their Equipment, by F. B. Dresslar and H. Pruett, 1930, 74 pp., ill., plans. Government Printing Office, Washington, D. C.

2. Essentials of Swimming Pool Sanitation, by C. A. Scott, 1931, 126 pp., ill., Lightner Publishing Corp., Chicago.

3. State Health Departments: Swimming pool regulations.

C. Heating, Air Conditioning, Lighting, Acoustics, Plumbing

1. School Ventilation, Principles and Practice, by New York Commission on Ventilation, 1931, 73 pp., Teachers College, Columbia University, New York. Finds no justification for the extensive mechanical equipment generally required by law and practice.

2. Standards of School Lighting with Suggested Requirements for a School Lighting Code, Illuminating Engineering Society, 29 West 39th St., New York, 20 cents a copy.

3. Standards of School Lighting, 1932, Illuminating Engineering Society, New York, and A. I. A.

4. Status of Natural Lighting in Modern Building Codes, by G. W. Thomas.

Delivered before Illuminating Engineering Society, Pittsburgh, Oct., 1931.

5. Architectural Acoustics, by V. O. Knudsen, 1932, 617 pp., ill., John Wiley & Sons, New York. One of the best recent books on the subject. Sections on auditoriums, pp. 343-399; on school buildings, pp. 419-439.

6. Public School Plumbing Equipment, by M. W. Thomas, 1928, 128 pp., charts, tables, bibl., Teachers College, Columbia University, New York. Discussion in general of the problem — standards based on theory, experiment and experience — check list — recommendations.

D. Construction, Materials, Details.

1. School Fires, National Fire Protective Association Bulletin, 1931, 25 cents a copy, 60 Batterymarch St., Boston, Mass. A record of 875 school fires.

E. SPECIAL PLANNING AND DATA—ARTICLES.

A. Educational

1. Planning Elementary Classrooms, by N. L. Engelhardt, Architectural Record, v. 69, May, 1931, pp. 427-431, ill., plans. Data on three standardized types.

2. Public School Stages, by F. A. Childs, American Architect, v. 139, May, 1931, pp. 28-31, ill., plans. Data on this neglected element.

3. Seating, by Kocher & Frey, Architectural Record, v. 71, Apr., 1932, pp. 261-272, ill., drawings. Excellent comparative data and details for theater, school and stadium.

4. Theater Reference Number, Architectural Forum, Sept., 1932.

5. Sound Motion Picture Requirements, H. B. Braun, ill., plans, Architectural Forum, v. 57, Oct., 1932, pp. 381-385.

B. Recreational

1. Facilities for School Athletics, by J. C. Llewellyn, Architectural Forum, v. 55, Dec., 1931, pp. 759-764, Part II, ill., plans. Requirements for small field houses — gyms — accessory rooms.

2. Buildings for Indoor Athletics, by D. B. Cathcart, Architectural Forum, v. 54, June, 1931, pp. 779-790, ill., plans.

3. Berlin Sports Forum, by W. March, Architectural Forum, v. 55, Oct., 1931, pp. 471-474, ill., plans.

4. Athletic building, Haverford, Pa., Barney & Banwell, Architects, Architectural Forum, v. 56, May, 1932, pp. 465-468, ill., plans.

5. Gymnasium Planning, by R. L. Davison, Architectural Record, v. 69, Jan., 1931, pp. 63-90, ill., plans.

6. Boys' gymnasium, Burbank Junior High School, Calif., Russ & Hardman, Architect and Engineer, v. 105, June, 1931, pp. 38, ill., plan.

7. Stadium and gymnasium for the Technical Institute at Hanover, Habicht, Wasmuths Monatshefte, v. 16, Sept., 1932, pp. 441-443, ill., pl.

8. Gymnasium and Athletic Club Check List (university), by I. D. Matthew, Architectural Record, v. 73, Feb., 1933, pp. 137-144

9. Payne Whitney Gymnasium, Yale University, J. R. Pope, Architectural Record, v. 73, Feb., 1933, pp. 74-104, ill. plans.

10. Design for a Swimming Bath in Reenforced Concrete, by F. Goldsmith, Architectural Review, London, v. 71, Apr., 1932, pp. 128-129, ill., plans.

11. Y.M.C.A. Swimming Pool Equipment, by A. E. Hansen, Architectural Forum, v. 53, Aug., 1930, pp. 237-240, Part II, ill., plans.

12. Underwater Lighting for Swimming Pools, Architectural Record, v. 68, Dec., 1930, pp. 470-472, ill., diagrams.

13. Detail of Swimming Pool Sections, by J. G. Stewart, Architecture, v. 67, Feb., 1933, pp. 104, drawings.

14. Sterilizing the Modern Pool, by C. Ninekirk, Architect and Engineer, v. 110, Sept., 1932, pp. 37-39, ill.

15. National Swimming Hall, Hungary, A. Hajos, Architectural Forum, v. 60, May, 1934, pp. 352-353, ill., plans.

16. Indoor Swimming Pool in Sweden, P. Hedquist, Architectural Review, v. 75, Apr., 1934, pp. 130-131, ill., plans.

17. Planning and Design of Public and Private Swimming Baths, by K. M. B. Cross, Royal Institute of British Architects Journal, ser. 3, v. 41, Jan. 13, 1934; Mar. 10, 1934, pp. 213-230, and p. 467.

18. Playfield Space Requirements, Architectural Record, v. 73, Jan., 1933, p. 15, plan.

19. Dimension Diagrams for Sports, Games, by Brown & O'Rourke, Architectural Record, v. 74, Dec., 1933, pp. 450-456.

20. Reference section on swimming pools, ill., plans. L'Architecture d'Aujourd'hui, v. 5, ser. 4, No. 3, Apr., 1934, pp. 54-77.

C. Heating, Air Conditioning, Lighting, Acoustics, Plumbing

1. Floors As Heating Ducts in Schools, by S. R. Lewis, American Architect, v. 138, July, 1930, pp. 42-43, drawings.

2. Modern School Ventilation, by F. J. Duffield, Architectural Forum, v. 55, Dec., 1931, pp. 755-758, Part II.

3. Lighting and Electrical Systems for School Buildings, by N. C. Ross, Architectural Forum, v. 55, Dec., 1931, pp. 743-752, ill., plans.

4. Lighting the Classroom, by H. L. Logan, Architectural Record, v. 70, July, 1931, pp. 54-55, table.

5. Lighting Classrooms in Chicago, by R. W. Yardley, Architectural Record, v. 70, Sept., 1931, p. 64, sup.

6. Plumbing Sanitation for Schools, by M. W. Thomas, Architectural Forum, v. 55, Dec., 1931, pp. 765-768, Part II.

D. Construction, Materials, Details

1. Economies of School Structure, Architectural Forum, v. 55, Dec., 1931, pp. 733-737, Part II, ill., drawings.

2. Materials and Details, by Womrath & Enger, ARCHITECTURAL FORUM, v. 55, Dec., 1931, pp. 738-742, 753-754, Part II.

F. ILLUSTRATIONS—PLANS—DESCRIPTIONS.

a. High Schools and Consolidated Schools.

ARCHITECTURAL FORUM:

1. Portfolio of nine senior and junior-senior high schools, v. 55, Dec., 1931, pp. 649-676.

2. A Suburban Consolidated School, Walker, Guilbert & Betelle, Bronxville, N. Y., ill., plans, notes; v. 55, Dec., 1931, pp. 677-680.

AMERICAN ARCHITECT:

3. Englewood High School, Englewood, N. J., L. C. Licht, ill., plans, v. 144, Mar., 1934, pp. 14-17.

4. Central High School, Amherst, N. Y., Harbach & Kideney, ill., plans, v. 144, July, 1934, pp. 63-66.

OTHER PERIODICALS:

5. Lower Merion Senior High School, Merion, Pa., Savery & Scheetz, ill., plans, ARCHITECTURE, v. 68, July, 1933, pp. 33-36.

6. Dukinfield Senior Girls School, England, Percy Howard, ill., plans, ARCHITECT AND BUILDING NEWS, London, v. 133, pp. 251-252.

7. High Storrs School, Sheffield, England, W. G. Davies, ill., plans, ARCHITECT'S JOURNAL, London, v. 78, Aug. 31, p. 268.

8. North Heath Senior School, Kent, England, H. Hind, desc. plans, ARCHITECTURAL REVIEW, London, v. 74, Dec., 1933, pp. 42-50 in sup.

9. Dorotheenschule, Berlin-Köpenick, Max Taut, ill., plans, BAUWELT, Berlin, v. 21, No. 4, 1930, pp. 121, pl. 1-16.

L'ARCHITECTURE D'AUJOURD'HUI, v. 1, Nov., 1930, p. 32 and plates.

10. Lünen Realgymnasium, Germany, K. W. Schulze, ill., plans, BAUWELT, v. 23, pp. 826-828.

11. Alstertal school, Hamburg, F. Schumacher, ill., plans, MODERNE BAUFORMEN, Stuttgart, v. 30, Aug., 1931, pp. 404-414.

12. Oberlyzeum im Zoppot, Germany, Mebes & Emmerich, ill., plans, WASMUTHS MONATSHEFTE, Berlin, v. 16, Feb., 1932, pp. 49-56.

13. Two projects, F. Freymuller, elevations, plans, MONATSHEFTE FÜR BAUKUNST, Berlin, v. 17, Apr., 1933, p. 152.

14. German school in Helsingfors, R. Eklund, ill., plans, MONATSHEFTE FÜR BAUKUNST, v. 18, July, 1934, pp. 317-322.

15. Walddörfer schools, Hamburg, F. Schumacher, ill., plans, NUEVAS FORMAS, Madrid, v. 1, No. 1, 1934, pp. 11-16.

WASMUTHS MONATSHEFTE, v. 16, Oct., 1932, pp. 467-472.

16. Kirchenpauer-Realgymnasium, Hamburg, Bomhoff & Schone, ill., plans, BAUWELT, v. 23, pp. 821-825.

17. Katharina-Realschule, Stockholm, Dahul & Hedquist, ill., plans, BAUWELT, v. 24, May, 1933, pp. 545-548.

MONATSHEFTE FÜR BAUKUNST, v. 17, June, 1933, pp. 256-268.

b. Junior High Schools and Other Intermediate Types.

1. Portfolio of Three Junior High Schools, ill., plans, ARCHITECTURAL FORUM, v. 55, Dec., 1931, pp. 693-700.

2. Junior High School Altadena, Calif., Marston & Maybury, ill., plans, ARCHITECTURAL RECORD, v. 72, Aug., 1932, pp. 111-114.

3. Fieldston School, Riverdale-on-Hudson, N. Y., Stein & Kohn, ill., plans, ARCHITECTURAL RECORD, v. 67, Apr., 1930, pp. 314-320.

4. Vallejo Junior High School, Calif., F. H. Reimers, ill., plans, ARCHITECT AND ENGINEER, v. 116, Feb., 1934, pp. 10-18.

c. Elementary Schools.

ARCHITECTURAL FORUM:

1. Portfolio of Thirteen Elementary Schools, ill., plans, v. 55, 1931, pp. 701-724.

2. Elementary School in Hamburg, Germany, F. Schumacher, ill., plans, v. 58, Feb., 1933, pp. 140-142.

3. School Group at Villejuif, France, A. Lurcat, ill., plans, v. 58, Apr., 1933, pp. 297-298.

4. Schools at Hilversum, William Dudok, ill., plans, v. 59, Oct., 1933, pp. 299.

5. Glen Rock Public School, Glen Rock, N. J., remodeling plans, v. 58, Jan., 1933, pp. 46-47.

6. School at Brno, Czechoslovakia, M. Kyselka, ill., plans, v. 60, Mar., 1934, p. 211.

7. LA CASA DEL BALILLA, Pescara, Italy, Paniconi & Pediconi, ill., plans, CASA BELLA, Milan, v. 7, No. 74, Feb., 1934, p. 43.

8. CASE BALILLA, Italy, Mansutti & Miozzo, ill., plans, CASA BELLA, v. 6, No. 12, Dec., 1933, pp. 32-39.

9. Two municipal primary schools in Tokyo, municipal architect, ill., plans, KOKUSAI-KENCHIKU-KYOKAI, Tokyo, v. 9, No. 12, Dec., 1933, pp. 270-272.

10. School at Brno, Czechoslovakia, Fuchs & Polasek, ill., no plan, OBRAS, Madrid, v. 4, No. 33, Sept., 1934, pp. 292-293.

11. Ellington School, Maidenhead, England, Leathart, & Granger, ill., plan, ARCHITECTURE ILLUSTRATED, London, v. 5, Dec., pp. 1932, pp. 187-188.

ARCHITECTURAL RECORD:

13. Project for Indianapolis, W. D. Teague, elevation, plans, v. 70, Dec., 1931, pp. 413-415.

14. Hempstead, L. I., N. Y., two schools, Ernest Sibley, ill., plans, v. 72, Aug., 1932, pp. 125-126.

15. Denver, Colo., elementary school, W. E. and A. A. Fisher, ill., plans, v. 73, May, 1933, pp. 329-331.

16. Sherman Oaks School, Calif., W. L. Risley, ill., plans, v. 74, Sept., 1933, pp. 201.

17. Western Springs, Ill., grade school, Johnck & Ehmann, ill., plans, v. 74, Nov., 1933, pp. 370-371.

18. Mexico, Federal elementary schools, J. O'Gorman, ill., plans, v. 75, May, 1934, pp. 444-446.

OTHER PERIODICALS:

19. School at Celle, Germany, O. Haesler, ill., plans, AMERICAN ARCHITECT, v. 138, Aug., 1930, pp. 24-27.

20. Avery Coonley School, Downers Grove, Ill., W. Faulkner, ill., plans, AMERICAN ARCHITECT, v. 144, Mar., 1934, pp. 11-13.

21. School group at Villejuif, France, A. Lurcat, ill., plans, AMERICAN ARCHITECT, v. 144, Mar., 1934, pp. 19-21.

L'ARCHITECTE, July, 1933, pp. 83-86, pl. 40-41.

CONSTRUCTION MODERNE, Paris, v. 49, 1933, pp. 146-152.

22. Flower Hill School, Port Washington, N. Y., W. S. Bessell, ill., plans, ARCHITECTURE, v. 61, June, 1930, pp. 349-352.

23. Three schools at Hilversum, Holland, William Dudok, views only, ARCHITECTURE, v. 62, Aug., 1930, pp. 93-96.

24. Schools at Hilversum, William Dudok, ill., ARCHITECT AND BUILDING NEWS, v. 124, 1930, pp. 180-3, 209-11.

25. School at Sieggraben, Germany, Kaym & Hetmanek, ill., plans, MODERNE BAUFORMEN, v. 33, June, 1934, pp. 296-297.

26. G. S. Stoneman School, San Marino, Calif., Marsh, Smith & Powell, ill., ARCHITECT AND ENGINEER, v. 118, July, 1934, pp. 10-17.

27. Whitgift Grammar School, Croydon, England, Leathart & Granger, ill., plans, ARCHITECT AND BUILDING NEWS, v. 127, 1931, pp. 153-157. ARCHITECTURAL REVIEW, v. 70, Aug., 1931, pp. 41-42.

28. Manchester Grammar School, England, Worthington & Jones, ill., plans, ARCHITECT AND BUILDING NEWS, v. 128, 1931, pp. 118-122. ARCHITECTURAL REVIEW, v. 71, Mar., 1932, pp. 87-91.

29. Wörsdorf School, Germany, Kaufmann & Naumann, ill., plans, ARCHITECT AND BUILDING NEWS, v. 133, 1933, pp. 344-346. MONATSHEFTE FUR BAUKUNST, v. 17, Jan., 1933, pp. 1-6.

30. Husum School, Copenhagen, Thomsen & Schlegel, ill., plans, ARCHITECT'S JOURNAL, England, v. 75, Jan. 13, 1932, pp. 65-68.

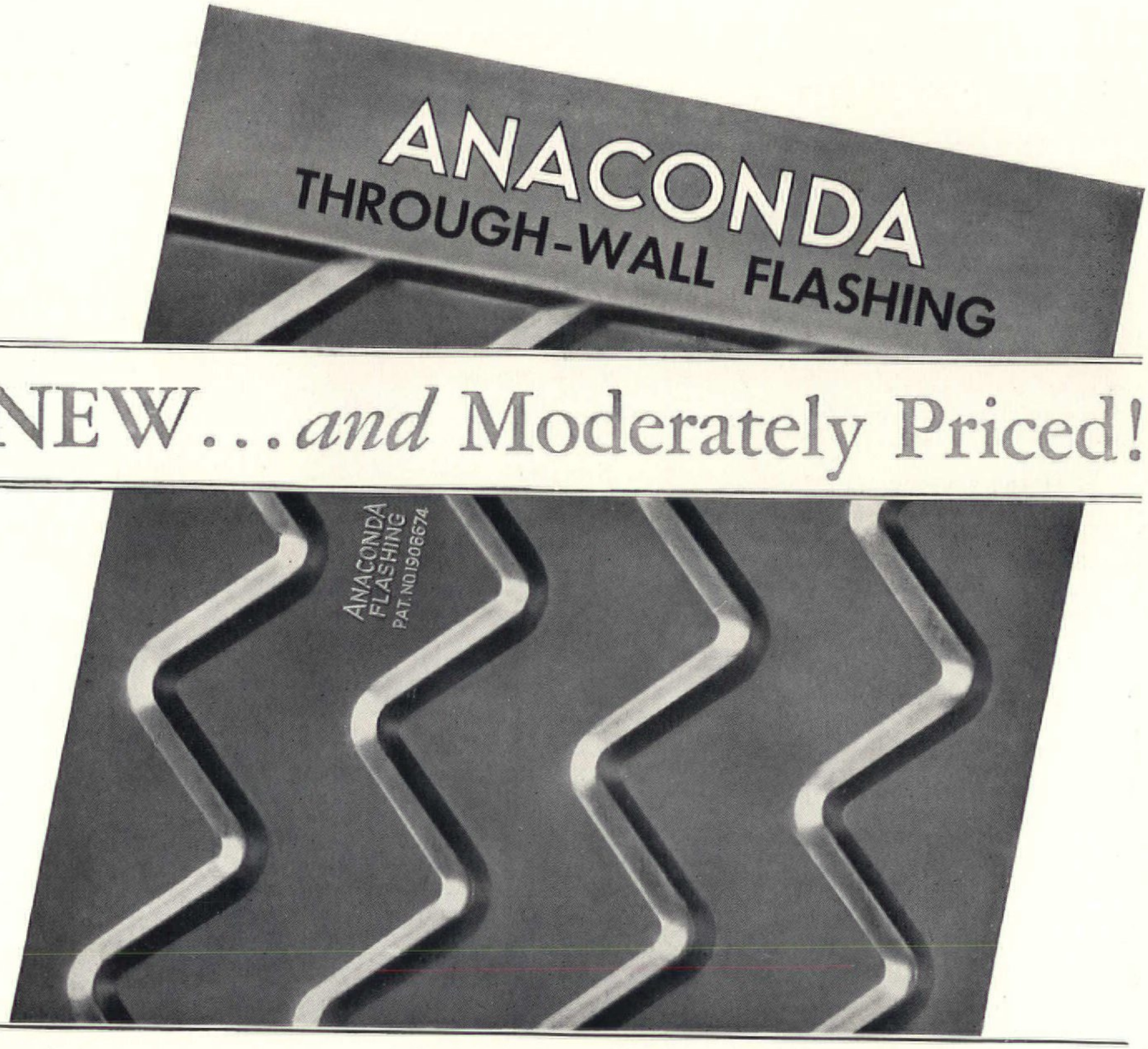
31. Frankfort School. M. Elsaesser, ill., no plan, ARCHITECT'S JOURNAL, v. 77, Feb. 8, 1933, pp. 199-202.

32. Elementary school at Southport, England, Grayson & Barnish, ill., plans, ARCHITECT'S JOURNAL, v. 74, Sept. 23, 1931, pp. 401-403.

33. Wardie Elementary School, Edinburgh, J. M. Johnston, ill., plans, ARCHITECT'S JOURNAL, v. 76, Sept. 21, 1932, pp. 355-357.

34. Kingsbury County School, London, W. T. Curtis, ARCHITECTURE ILLUSTRATED, London, v. 6, Jan., 1933, pp. 18-20.

35. Preston Park Council School, Wembley & Roe Green Council School, Kingsbury, ARCHITECTURE ILLUSTRATED, v. 6, Jan., 1933, pp. 28-31.



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36. Several elementary schools in Hamburg, Germany, F. Schumacher, ill., plans. ROYAL INSTITUTE BRITISH ARCHITECTS JOURNAL, ser. 3, v. 38, Sept. 19, 1934, pp, 715-724.

MODERNE BAUFORMEN, v. 30, Aug., 1931, pp. 404-414.

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37. School group in Algeria, X. Salvador, ill., plans, L'ARCHITECTE, Feb., 1933, pp. 21-22, pl. 12.

38. School group Paul-Doumer at Cachan, France, Mathon, Chollet & Chaussat, ill., plans, L'ARCHITECTE, Apr., 1933, pp. 49-51, pl. 22-23.

39. School group at Boulogne-Billancourt, Cauwet & Oge, ill., plans, L'ARCHITECTE, Oct., 1933, pp. 117, pl. 55. CONSTRUCTION MODERNE, v. 48, Apr. 16, 1933, pp. 434-442.

40. School group Octobre at Alfortville, G. Gautier, ill., plans, L'ARCHITECTE, Apr.-May, 1934, pp. 33-41, pl. 7-12.

41. School at Châlons-sur-Marne, E. Maigrot, ill., plans, L'ARCHITECTURE, v. 47, 1934, pp. 145-154.

42. School at Boulogne-sur-Seine, J. Debat-Ponson, desc., ill., no plan, L'ART VIVANT, Mar., 1934, pp. 132-133.

43. School at Nogent-sur-Marne, Maurey & Hillion, ill., plans, CONSTRUCTION MODERNE, v. 48, Mar. 26, 1934, pp. 392-400.

44. Competition for town of Fontainebleau school group, ill., plans, CONSTRUCTION MODERNE, v. 47, May 15, 1932, pp. 539-551.

45. School at Wandsbeck, Germany, Kroncke & Wahl, ill., plans, L'ARCHITECTE, June, 1930, pp. 50-52, pl. 34-35.

46. School near Dresden, P. Wolf, ill., plans, L'ARCHITECTE, July, 1931, pp. 57-59, pl. 42.

47. Village school, Ober-Weistritz, E. Pietrusky, ill., plans, WASMUTHS MONATSHEFTE, v. 15, Sept., 1931, pp. 409-412.

48. Bavnehoj School, Denmark, P. Holsoë, ill., plans, WASMUTHS MONATSHEFTE, v. 15, Sept., 1931, pp. 403-404.

49. Fasanenhof School, Kassel, Germany, Catta & Groth, ill., plans, WASMUTHS MONATSHEFTE, v. 15, Sept., 1931, pp. 405-408.

50. School in Hanover, Germany, K. Elkaart, ill., plans, WASMUTHS MONATSHEFTE, v. 16, Oct., 1932, pp. 459-463.

51. Schuttersweg school, Hilversum, William Dudok, ill., plans, WASMUTHS MONATSHEFTE, v. 16, Dec., 1932, p. 590.

52. Volksschule, Wuppertal-Vohwinkel, Germany, Hollatz, Krefeld & Schrader, ill., plans, MONATSHEFTE FÜR BAUKUNST, v. 17, Jan., 1933, pp. 7-8.

53. Sumatralaan school, Hilversum, William Dudok, ill., plans, MONATSHEFTE FÜR BAUKUNST, v. 17, Dec., 1933, p. 536.

54. Woltersdorf School, O. Risse, ill., plans, MONATSHEFTE FÜR BAUKUNST, v. 17, Dec., 1933, pp. 534, 535.

55. Girls' school near Athens, A. Kriesis, ill., plans, MONATSHEFTE FUR BAUKUNST, v. 17, Dec., 1933, pp. 529-532.

56. German Elementary School for Sofia, Bulgaria, J. Tiedemann, elev., plan, MONATSHEFTE FUR BAUKUNST, v. 18, Feb., 1934, p. 81.

57. School at Heerlen, Holland, F. P. J. Peutz, ill., plan, MODERNE BAUFORMEN, v. 32, Dec., 1933, pp. 649-652.

58. Project for Cairo, Egypt, C. Busiri-Vici, views, plan, ARCHITETTURA ITALIANA, v. 29, 1934, pp. 12-15.

59. Elementary School in Rome, I. Guidi, ill., plans, ARCHITETTURA ITALIANA, v. 28, 1933, pp. 5-8.

L'ARCHITECTURE D'AUJOURD'HUI, v. 4, ser. 3, No. 4, May, 1933, pp. 35-37.

CAPITOLIUM, Milan-Rome, 1933, Jan., pp. 35-42, no plan.

60. School at Brno, Czechoslovakia, M. Kyselka, ill., plans, DER BAUMEISTER, v. 30, No. 6, June, 1932, pp. 216-228.

61. School in Vienna, Baumgarten & Hofbauer, ill., MONATSHEFTE FÜR BAUKUNST, v. 17, Dec., 1933, p. 533.

62. Small school in Madrid, F. Salvador, ill., plans, NUEVAS FORMAS, v. 1, 1934, No. 1, pp. 19-20.

63. Institute School, Madrid, Arniches & Dominguez, ill., plans, NUEVAS FORMAS, v. 1, 1934, No. 1, pp. 5-10.

BAUWELT, v. 24, May, 1933, pp. 549-552.

MONATSHEFTE FÜR BAUKUNST, v. 17, June, 1933, pp. 269-272.

64. Small school in North Spain, M. Vias, ill., plans, NUEVAS FORMAS, v. 1, 1934, No. 1, pp. 17-18.

d. Kindergartens and Nursery Schools.

1. Interior views, Viennese kindergarten, F. Singer, ARCHITECTURAL FORUM, v. 57, Dec., 1932, pp. 503-507.

2. Colored isometrics Viennese kindergarten interiors, ARCHITECTURAL FORUM, v. 57, Dec., 1932, p. 517.

3. Nursery building, Oak Lane Country-Day School, Pa., Howe & Lescaze, ill., plan, ARCHITECTURAL RECORD, v. 67, Apr., 1930, pp. 360-363.

ARCHITECTURAL REVIEW, London, v. 71, Mar., 1932, p. 92.

DER BAUMEISTER, v. 30, No. 11, Nov., 1932, pp. 382.

4. Kindergarten Zurich-Wiedikon, Kellermuller & Hofmann, ill., plans, ARCHITECTURAL RECORD, Sept., 1933, pp. 202-204.

L'ARCHITECTE, May, 1933, pp. 63-64, pl. 30.

DER BAUMEISTER, v. 30, No. 11, Nov., 1932, p. 377, pl. 95-96.

5. Kindergarten at Hilversum, William Dudok, ill., desc., ARCHITECT AND BUILDING NEWS, v. 124, 1930, pp. 239-241.

6. Kindergarten at Königgratz, Czechoslovakia, J. Gočar, ill., plans, ARCHITECTURAL REVIEW, v. 69, May, 1931, pl. 8.

7. Five Viennese kindergartens, Schuster, Ehn & Leischner, ill., plans, MODERNE BAUFORMEN, v. 30, Dec., 1931, pp. 630-636.

8. Two kindergartens at Prague, municipal architect, ill., plans, NUEVAS FORMAS, v. 1, 1934, pp. 251-253, 256-257.

9. Nursery school at Vanves, France, P. & M. Marme, ill., plans, ART ET DECORATION, May 1933, pp. 139-146.

OBRAS, v. 4, No. 28, Mar., 1934, pp. 118-123, ill., no plans.

10. Student project, Atelier Lurcat, model, plan, details, L'ARCHITECTURE D' AUJOURD'HUI, v. 5, 4 ser, No. 5, June, 1934, pp. 80-82.

11. Nursery school at Gennevilliers, France, F. Dumail, ill, plans, L'ARCHITECTURE D'AUJOURD'HUI, ser. 3, No. 4, May, 1933, pp. 5-8.

e. Open Air Schools.

1. Open air school, Holland, H. B. van Broekhuizen, ill., ARCHITECTURAL FORUM, v. 59, Oct., 1932, pp. 302.

2. Open air school, Amsterdam, Duiker, ill., ARCHITECTURAL RECORD, v. 69, Jan., 1931, p. 58. ARCHITECTURE VIVANTE *Printemps*, 1933, pl. 16-18, ill., plans.

3. Open air school, Maastricht, Holland, F. P. J. Peutz, ill., plans, MODERNE BAUFORMEN, v. 32, Dec., 1933, pp. 653-658.

4. Open air school, Birmingham, England, J. H. Hawkes & Son, ill., plans, ARCHITECT AND BUILDING NEWS, v. 128, 1931, pp. 64-65.

5. Open air school, Derbyshire, England, G. H. Widdows, ill., plans, ARCHITECT'S JOURNAL, v. 72, Sept. 24, 1930, pp. 449-451.

6. Hurtwood School, Surrey, England, C. Williams-Ellis, ill., plans, ARCHITECTURAL REVIEW, v. 75, Jan., 1934, pp. 8-9.

7. St. Quentin open air school, France, G. Debré, ill., plans, L'ARCHITECTE, Apr., 932, pp. 27-29, pl. 19. WASMUTHS MONATSHEFTE, v. 16, Oct., 1932, pp. 464-466.

f. Boarding and Preparatory Schools.

1. Haverford School, Pa., Barney & Banwell, ill., plans, ARCHITECTURAL FORUM, v. 56, May, 1932, pp. 461-468.

2. Kingswood Girls' School, Mich., E. Saarinen, ill., plans, ARCHITECTURAL FORUM, v. 56, Jan., 1932, pp. 37-60.

3. Dartington School, S. Devon, England, Howe & Lescaze, ARCHITECTURAL RECORD, v. 73, May, 1933, pp. 384-385.

4. Santa Barbara School for Boys, R. D. Johnson, ill., ARCHITECT AND ENGINEER, v. 111, Oct., 1932, pp. 31-35.

5. Merchant Taylors' School, Rickmansworth, England, W. G. Newton and partners, ARCHITECT AND BUILDING NEWS, v. 134, May 5, 1933, pp. 135-140; May 12, pp. 169-174. ARCHITECT'S JOURNAL, v. 77, May 3, 1933, pp. 591-596. ARCHITECTURAL DESIGN AND CONSTRUCTION, v. 3, May, 1933, pp. 267-274. ARCHITECTURAL REVIEW, v. 73, May, 1933, pp. 200-205.

6. Royal Masonic Institute for Girls, Rickmansworth, England, Denman & Sons, ill., plans.

ARCHITECT AND BUILDING NEWS, May 18, 1934, pp. 186-192, May 25, 1934, pp. 219-224.

ARCHITECTURE ILLUSTRATED, v. 8, June, 1934, pp. 177-189.

7. Royal Hospital School, Naval training Suffolk, England, Buckland & Haywood, ARCHITECTURAL REVIEW, v. 73, Mar., 1933, pp. 120-122.

8. Boys' School at Cranbrook, Mich., E. Saarinen, ill., no plan, ARCHITECT'S JOURNAL, v. 71, Jan. 8, 1930, pp. 73-79.

g. Vocational, Technical High Schools. Special Types:

1. Rindge Technical High School, Cambridge, Mass., R. H. Doane, ill., plan, ARCHITECTURAL FORUM, v. 59, Oct., 1933, pp. 263-272.

2. Vocational school, N. J., Guilbert & Betelle, ill., plans, ARCHITECTURAL RECORD, v. 76, Aug., 1934, pp. 82-88.

3. Science Buildings Bedford School, England, O. P. Milne, ill., plans, ROYAL INSTITUTE BRITISH ARCHITECTS JOURNAL, ser. 3, v. 41, Dec. 9, 1933, pp. 132-135.

4. Gymnasium Building Bedford School, England, ill., plans, ROYAL INSTITUTE OF BRITISH ARCHITECTS JOURNAL, v. 41, Dec. 23, 1933, pp. 183-185.

5. Liverpool School of Architecture, Reilly, Budden & Marshall, ill., plan, ARCHITECT AND BUILDING NEWS, v. 135, July 21, 1933, pp. 67-70.

6. Technical school, Fredriksberg, Denmark, Thorson & Tvede, ARKITEKTEN MAANEDSHAEFTE, v. 32, March, 1930, pp. 63-68.

7. Königsberg Girls Trade School, Germany, Hopp & Lucas, ill., plans, MODERNE BAUFORMEN, v. 30, June, 1931, pp. 290-299.

8. Hamburg-Eimsbüttel Commercial School, Hinsch & Deimling, ill., plans, MODERNE BAUFORMEN, v. 31, Feb., 1932, pp. 73-77.

9. Technical High School, Berlin, Weissgerber & Schirmer, ill., plans, WASMUTHS MONATSCHEFTE, v. 16, Sept., 1932, pp. 409-414,457.

10. Trade school Hagen-Haspe, Germany, G. Oberste-Berghaus, ill., plans, MONATSHEFTE FÜR BAUKUNST, v. 17, June, 1933, pp. 261-264.

11. Project for a city school, Thompson & Churchill, ill., plans, ARCHITECTURAL FORUM, v. 52, Jan., 1930, pp. 65-69.

12. New School for Social Research, New York, Joseph Urban, ill., plans, ARCHITECTURAL RECORD, v. 67, Apr., 1930, pp. 305-309.

13. St. Madeleine Sophie's Parish School, Germantown, Pa., H. A. Dagit & Sons, ill., plan, ARCHITECTURAL FORUM, v. 54, Feb., 1931, pp. 167-72, 253-254. Parts I and II.

14. St. Anselm's R. C. School, Harrow, England, A. D. Reid, ill., plans, ARCHITECTURAL RECORD, v. 74, Sept., 1933, pp. 202-204. ARCHITECTS' JOURNAL, v. 77, Apr. 5, 1933, pp. 457-459. ARCHITECTURE ILLUSTRATED, v. 5, Dec., 1932, pp. 171-172.

15. Liverpool School for the Blind, Minoprio & Spencely, ill., plans, ARCHITECT AND BUILDING NEWS, v. 132, Oct. 7, 1932, pp. 8-10. ARCHITECT'S JOURNAL, v. 76, Oct. 5, 1932, pp. 432-435.

16. Library building for Toyama H. S., Japan, Yamaguichi-Bunzō, model, drawings, KOKUSAI-KENCHIKU-KYOKAI, v. 10, No. 6, June, 1934, pp. 158-159.

h. Portfolios.

1. Seven school buildings, ill., plans, ARCHITECTURAL FORUM, v. 53, Nov., 1930, pp. 595-609.

2. Ten elementary, high and one country day school, ill., plans, ARCHITECTURAL RECORD, v. 69, May, 1931, pp. 389-409.

3. Portfolios of schools:

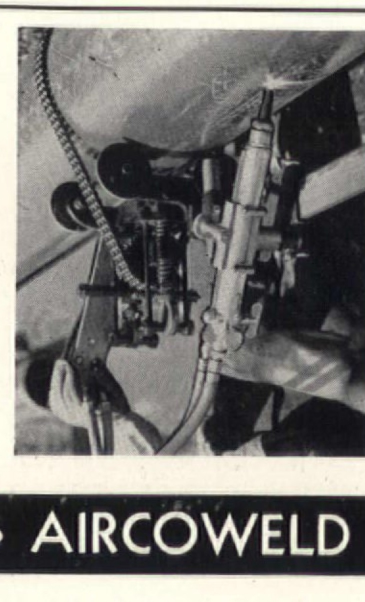
ARCHITECTURAL RECORD, v. 70, Dec., 1931, pp. 401-409, v. 72, Aug., 1932, pp. 127-136, v. 76, Aug., 1934, pp. 89-96, 102-112.

4. Recent schools by Guilbert & Betelle, ARCHITECTURE, v. 65, May, 1932, pp. 253-280.

5. Recent schools by Cole & Brouchoud, ARCHITECT AND ENGINEER, v. 107, Oct., 1931, pp. 20-28.

6. New schools of the Middlesex County Council, England, ROYAL INSTITUTE OF BRITISH ARCHITECTS JOURNAL, ser. 3, v. 41, July, 21, 1934, pp. 918-923.

7. English schools, ARCHITECTURE ILLUSTRATED, v. 5, Dec., 1932, pp. 161-189.



FORUM OF EVENTS

(Continued from page 18)

began to simmer and the newspapers to forget. But what interested educators throughout the land was the question: was the Philadelphia "tin schoolhouse" merely a local incident, or was it a manifestation of a schoolhouse shortage throughout the U. S.? THE ARCHITECTURAL FORUM, this month, discusses many facts of this question. Many a far-seeing architect saw implied in the Philadelphia incident two important facts that all educators know: (1) in many a U. S. public school district the pupils are crowded into inadequate space, (2) many an existing U. S. schoolhouse is out of date and inefficient, needs renovating or substitution. No wise architect could mistake the promise these facts offered to his profession.

¶ New York State is generally considered progressive so far as education is concerned. Yet a recent survey of the State Planning Board revealed that eight up-State children had a school and the services of a teacher all to himself. The cost to the State (excluding cost to the individual district) was in each case $1,166.51. Said the report:

"In eight school districts having eight school pupils and eight teachers the total annual school bill is $10,253," their report said. "Of this $2,122 only is borne by the taxpayers directly benefiting. For approximately $95,000 the State could own outright the entire land area and thus be relieved of the $7,837 cost of schools.

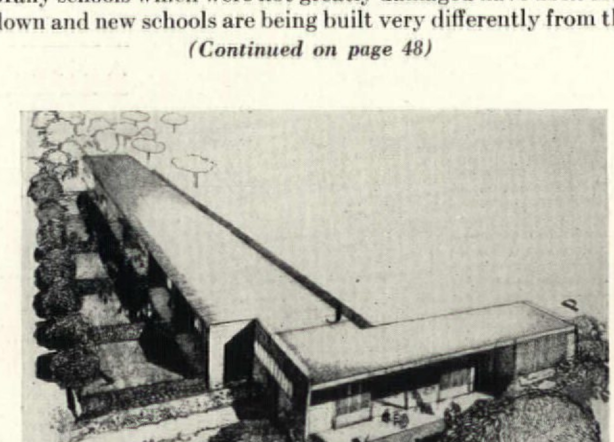
"There are 245 one-teacher schools with five or less students," the report showed. "There are 8 with one pupil, 15 with 2, 53 with 3, 72 with 4 and 97 with 5. Of these 245 districts 175 had an average daily attendance of less than 5 for the past three years."

Significant were the report's conclusions:

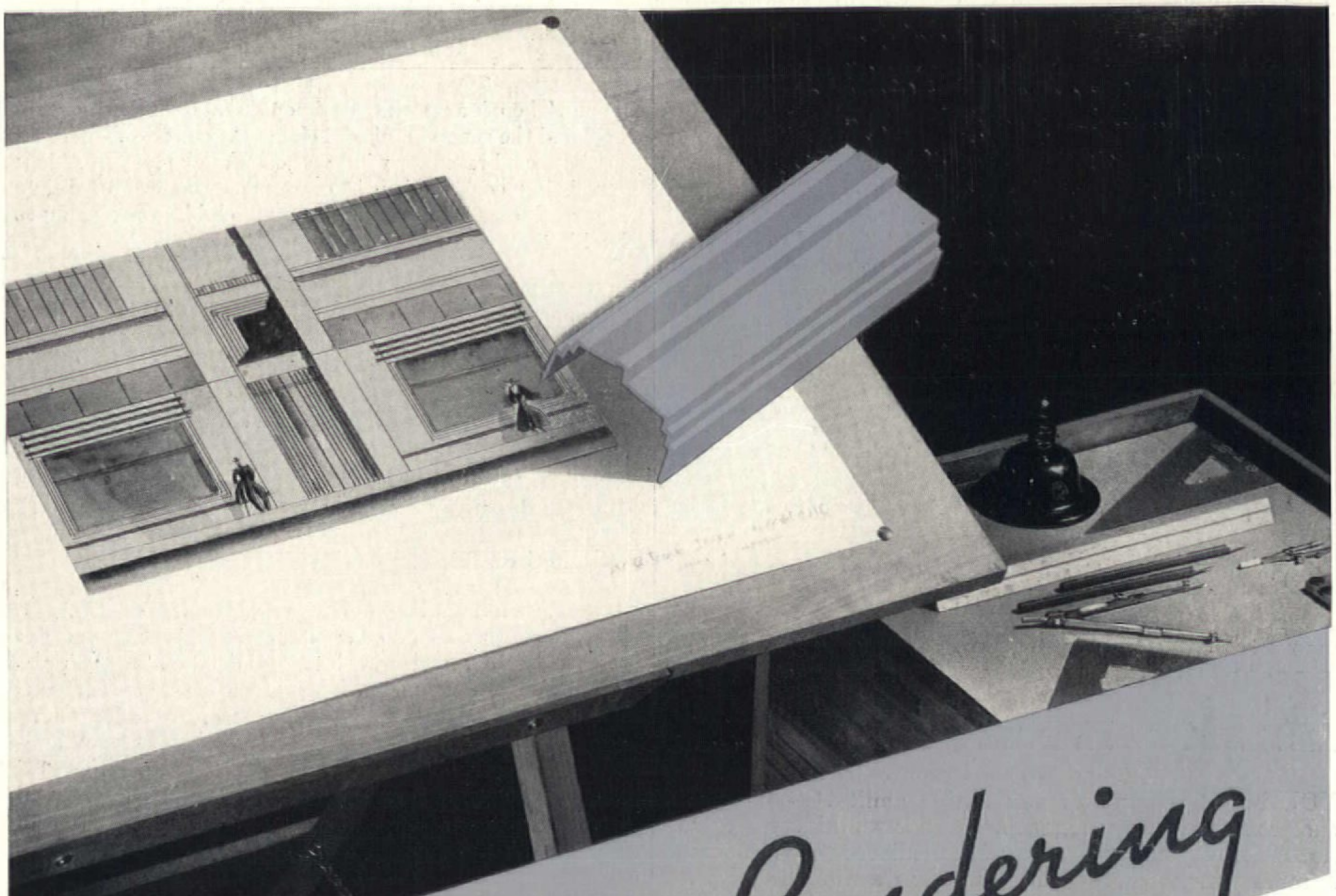
Under State ownership the taxpayers of the State would be saved the expense of schools and roads, the State would in time benefit greatly from timber production and the present owners would have an opportunity to move to areas where a better livelihood might be obtained."

¶ California's last serious earthquake occurred outside of school hours. Damage to schools therefore killed no children. It did call attention to bad construction. California now has the Field Act, which sets very rigid new standards of safety. Many schools which were not greatly damaged have been torn down and new schools are being built very differently from the

(Continued on page 48)



Now Building in Bell, California
Richard J. Neutra, Architect



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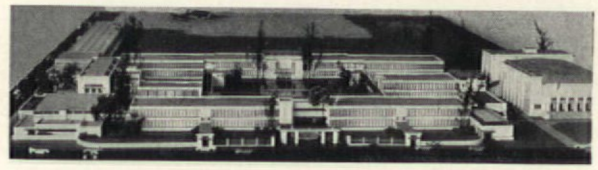
FORUM OF EVENTS

(Continued from page 46)

old ones. There is a growing sentiment in favor of the one story school and the general limit of height is two stories. Buildings must be cross braced for wind and earthquake stresses. Light fire-resisting construction is encouraged instead of heavy masonry. Meanwhile, many California children are going to school in tents, and other temporary structures.



Long Beach Polytechnic School
Hugh R. Davies, Architect

FORUM'S KITCHEN COMPETITION

SOMETIME within the hour before midnight Saturday, November 10, the last weary designer of the 233 who competed finished the last watercolor wash and trudged out to the post-office to mail his drawing in the Remodeled Kitchen Competition sponsored by THE ARCHITECTURAL FORUM and the following manufacturers: Armstrong Cork Company, Briggs Manufacturing Company, Crane Company, Electrolux Refrigerator Sales, Inc., Formica Insulation Company, General Electrical Company, International Nickel Company, Inc., Pittsburgh Plate Glass Company and Sloane-Blabon Corporation.

The Architectural Adviser spent the next week going over the drawings and preparing them for the judgment. On Monday, November 26, the jury met and concluded its labors. The jury consisted of Architects Harvey Stevenson, Chairman, Lawrence Moore, George F. Root, 3rd, and Mrs. Helen Judy Bond, Professor of Household Art at Teachers College, Columbia University.

No competition jury ever worked more conscientiously than this one. It required six hours to reduce the original 233 drawings to 35 from which the prizes and mentions were finally chosen. The awards:

First: Martin Elkind and Joseph Roberto, New York, N. Y.
Second: Don E. Hatch, New York, N. Y.
Third: Bergman S. Letzler, Louisville, Ky.
Fourth: Alfred N. Boell, New York, N. Y.
Fifth: Charles G. Ramsey, Harold R. Sleeper and J. Gilbert Werle, New York, N. Y.
Sixth: Herbert C. Hanson, Chicago, Ill.

Having completed this task the jury asked if it were within its power under the terms of the program to award mentions. Having been assured on this point, eight mentions were awarded as follows:

W. J. Neesner, Indianapolis, Ind.
Alice I. Soderman, Fall River, Mass.
Raymond J. Percival, Forestville, Conn.
John M. Kerr, Buffalo, N. Y.
Walter Bradnee Kirby, New Canaan, Conn.
Wendell R. Holt, Newton Center, Mass.
Charles E. Croom, Syracuse, N. Y.
J. Everette Fauber, Jr. and Trueheart Poston, Lynchburg, Va.

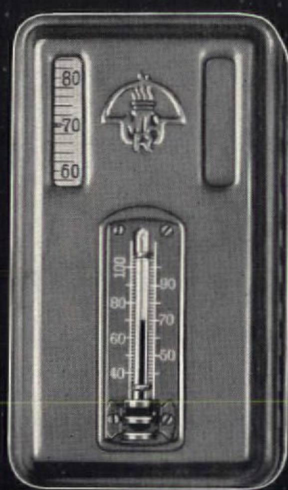
In judging the drawings the jury was guided in the first selection by considerations of proper planning alone. They were forced to eliminate many attractive and well-presented drawings because of failure to observe proper kitchen arrangement standards.

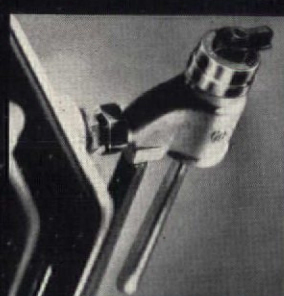
Only when it came to the question of awarding the prizes were considerations of esthetics and presentation admitted.

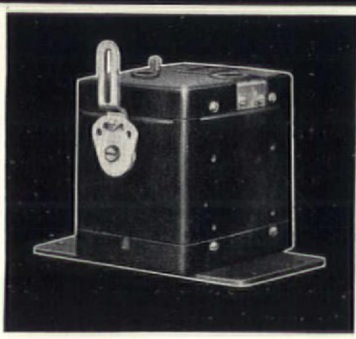
(Continued on page 52)

CONTROL COUNTS MOST IN SCHOOL BUILDINGS

IN the classroom, where young bodies must be kept healthy and young minds must be alert, the importance of proper temperature control cannot be overlooked. Minneapolis-Honeywell Modutrol Systems, tailor made for every building — old or new, large or small — provide proper temperature and ventilation control. At the same time, these modern electric systems afford fuel economies, often enough to pay their entire cost in less than one heating season. A Minneapolis-Honeywell Engineer in or near your city, can quickly show you the advantages of the Modutrol System. Minneapolis-Honeywell Regulator Company, 2740 Fourth Avenue South, Minneapolis, Minn. Branch or distributing offices in all principal cities.



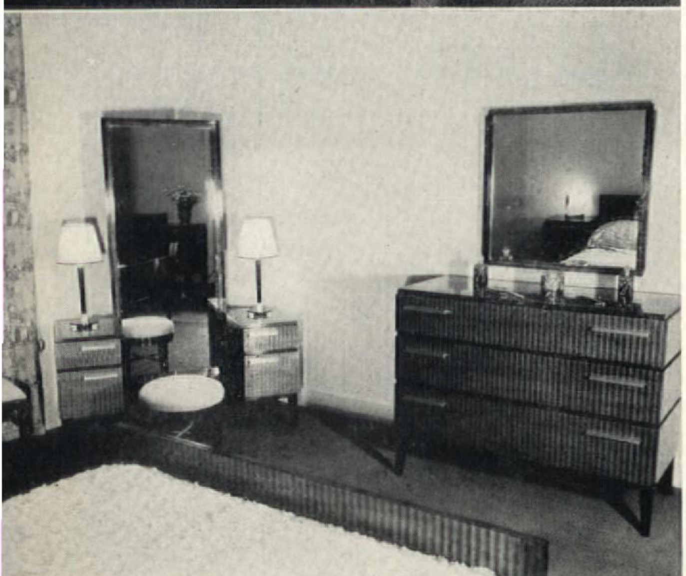




MINNEAPOLIS HONEYWELL

CONTROL SYSTEMS






PRODUCTS
AND
PRACTICE

. . . have created furniture for the prefabricated house that may become the first examples of "Modern American Style."

Mass produced housing, if it comes, will call for mass produced furniture. Too often the modern designer of furniture has created things that were too greatly at variance with the inherited tastes of the popular market. Furthermore, these pieces have generally been manufactured by cabinet-makers instead of furniture manufacturers with the result that costs have been too great and cheapness has been achieved only by neglect of quality.

Now a combination of two furniture factories, the Thomasville Chair Co. and the Finch Furniture Co., has embarked upon the production of a line of furniture that answers both these objections. Known as "Amodec" and designed especially for mass production by Donald Deskey and Leo Jiranek, this furniture comes nearer to what might be called "modern American style" than anything yet produced. This is particularly true of the maple suites. There is one of these for the bedroom and two for the dining room which will fit perfectly in any Connecticut farmhouse or Cape Cod cottage. The prices will bring them within the reach of every one who, liking the genuine antique with no fondness for its cheap reproduction, has hitherto been unable to consider using modern design.

If there is any one feature more outstanding than another it is the hardware. Instead of the too often present flimsy spinning this hardware is cast or extruded bronze of proper weight. It is used in either a natural finish or in chromium plate. Always it is a vital part of the design. The cheapness evidenced by the prices quoted with each picture is not obtained at the expense of quality. It is true that drawers are put together by the "lip method" rather than dovetailed, but this is nowadays common in almost everything but hand-made stuff.

For the rest the quality matches that of the hardware. A number of amusing woods have been used, notably one that has a regular stripe in a sort of moiré effect. Other pieces are painted in colors that will go with almost any background.

Though no figures are available it is evident that retailers of furniture are aware of the opportunity that has been presented to them. Architects who may want to help clients refurnish old homes or furnish new ones with modern furniture that is not likely to be outmoded tomorrow should be able to find it in the shops of their immediate neighborhood.

Top, Five-piece bedroom suite in maple and straw. Retail price $110. Next below, seven-piece dining room set in same materials. Price $125. Next to bottom, bedroom set of seven pieces in brown moiré walnut. $259. Bottom, seven-piece bedroom suite in white and brown enamel with burl maple. Price $295. Prices are for the furniture alone without the dressing table accessories, etc., and are the estimated retail prices furnished by the manufacturer.

PRODUCTS & PRACTICE (*Continued on page 54*)

MR. ARCHITECT

Here's Automatic Oil Heating You can Specify for ANY Job with the utmost Confidence

Apartment Saves $500 a Year
That's the saving in heating costs made by P. J. Driscoll, owner of the Elmwood Apartments of Holyoke, Mass.

"Ends fluctuating temperatures and eliminates many colds," says Edward Currie of the Nugent Home for Old Folks.

Even Temperature in Theatre
In the Playhouse Theatre, Dover, N. J., an even temperature is maintained at all times, thereby eliminating complaints.

"Saves $420.60 a year," says Miss Hollenbeck, Supt. of Silver Cross Nursery, "and converts waste space into storage space."

Druggist Saves Space
Says A. J. Meier, Philadelphia druggist: "It converts waste space into space that is now used profitably for storage."

"Saves time and fuel and its automatic features are outstanding" — according to F. L. Gold, owner, Belchertown, Mass.

Church Saves $720 a Year
This is the report of the Rev. Myles E. Galvin, Pastor of the Immaculate Conception School and Church, New Hartford, Conn.

"Save $425 a year by using Delco-Heat," says Harry A. Nurock, Secy. of the Naturopathic College and Hospital of Philadelphia.

AND HERE'S PROOF

When you specify Delco-Heat for any of your buildings, you can do so with complete confidence that it will perform perfectly at all times.

The complete satisfaction of thousands of Delco-Heat users is proof of this. Not only in homes but in schools, churches, apartment buildings, stores and industrial plants, Delco-Heat automatically provides clean, constant, dependable heat at remarkably low cost.

The quality of every one that's built—from the low-priced, fast-selling Delco-Heat conversion equipment to the harmonized Delco-Heat Boiler and Delco-Heat Conditionair—shows consummate skill in designing and engineering. Each product reflects the vast facilities of Delco Appliance Corporation, a subsidiary of General Motors.

Proof of these facts is shown by the statements of satisfied Delco-Heat users.

We invite you to mail the coupon for Architect's Manual, prepared by a consulting architect. It gives complete and detailed information exactly as you will want it in your file.

DELCO-HEAT

A PRODUCT OF GENERAL MOTORS

DELCO HEAT

A complete line of automatic oil heating equipment for domestic and commercial applications.

DELCO APPLIANCE CORPORATION
Dept. 81-L, Rochester, N. Y.

Please send me Architect's Manual for detailed information about Delco-Heat.

Name..........

Address..........

FORUM OF EVENTS

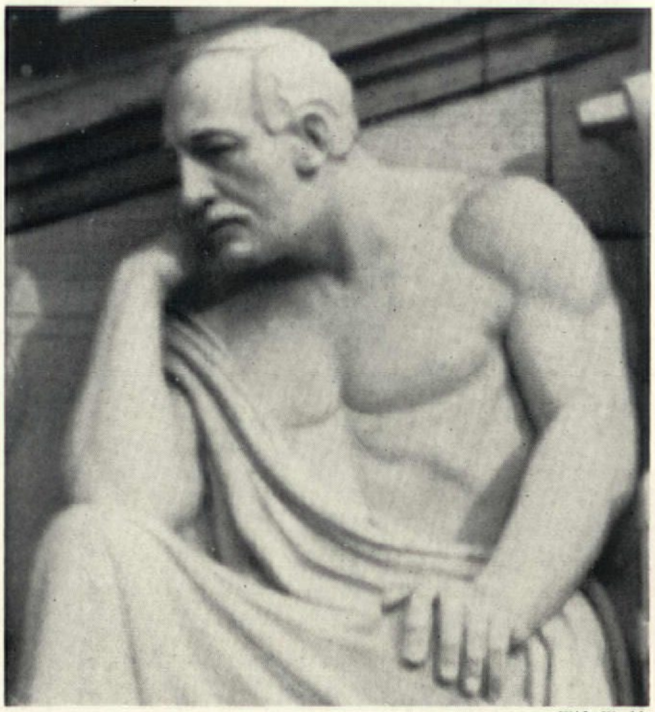
(Continued from page 48)

Of the first prize the preliminary report of the jury says: "The winning design shows a clear comprehension of the functions of the kitchen as used by the family outlined in the program. Its really comfortable dining alcove should prove a great convenience for many meals. The actual layout of the kitchen in this scheme was excellent. The feeling that its design might become slightly dated and a little conscious was perhaps not important."

In an early issue THE ARCHITECTURAL FORUM will present the complete report of the jury and reproductions of several prize-winning designs. In the meantime THE ARCHITECTURAL FORUM extends congratulations to the prizewinners. To those others who were not fortunate enough to be selected for awards THE ARCHITECTURAL FORUM and the sponsor manufacturers extend their warmest thanks for having helped to make this competition the success that every one has found it. Announcement of the subject and program of the second Architectural Forum Remodeling Competition will be made in an early issue.

CASS GILBERT MEMORIALIZED

AN alert observer squinted up at the big western pediment of Washington's new Supreme Court Building last month and thought he recognized in the group of symbolic figures sculpted therein a familiar face. He was right. Half-clad in a toga, pensively resting his head against his right hand was Cass Gilbert, the building's late, famed architect. He lacked the pince nez he always wore in life. Further scrutiny revealed more familiar faces: Chief Justice Hughes, one-time Secretary of State Elihu Root, Chief Justice Taft when he was a Yale undergraduate; John Marshall, when he was a lad, and Robert Aitken, sculptor of the group. In the center of the group are three symbolic figures, Liberty Enthroned, Authority, and Order. Cass Gilbert is in earnest conversation with Mr. Root.



Wide World

THE LATE CASS GILBERT
His back is turned on Solon

The building's eastern pediment, sculpted by Hermon A. MacNeil has for central figures Moses, Confucius and Solon.

PRODUCTS AND PRACTICE

(Continued from page 50)

101. NEW DUMBWAITER

Sedgwick Machine Works announce a new electric dumbwaiter called the "Roto-Waiter" for carrying loads of every nature up to five hundred pounds. This may be equipped with the newly perfected Overload and Slack Cable Device at a slight additional cost. This safety attachment instantly shuts off the electric current when the car is overloaded beyond a predetermined adjustable point or when the car is obstructed in its upward or downward travel. The shock of misuse is absorbed mechanically before it causes costly injuries to the electric mechanism. This Roto-Waiter is especially recommended by the manufacturers for under-counter installations.

102. NEW BRAZING FLUX

A new brazing flux called "Handy Flux" has just been announced by Handy & Harman. It has been developed to speed up and improve brazing operations on either ferrous or nonferrous metals. It has a lower melting point than other fluxes, greater solvent action, and insures thorough wetting of joint surfaces at low temperatures. It is made up in paste form ready for use and sold in one-half, one- and five-pound jars.

103. GAS WATER HEATER

Ruud Manufacturing Co. has recently announced the new Model W Automatic Gas Water Heater. Attractively designed, it is intended to serve the so-called *average home*. It is designed to give instant synchronization of lighting with the opening of the faucet. The heat-speed is in direct ratio to water flow so that there is no shrinkage in quantity or temperature so long as the faucet is open. All waterways are of non-corrosive brass and copper. The jacket is of porcelain enamel and polished chromium. Low in price, its B.T.U. input per hour is 110,000 with natural gas, 120,000 with manufactured gas.

104. METAL FINISHES

The American Nickeloid Co. is now producing what they call "American Bonded Metals." These come in finishes of chromium, nickel, brass and copper bonded to base metals of zinc, tin, steel, copper or brass. All of these are available not only in highly polished or soft satin finishes, but also in a number of patterned and striped designs. These various metals may be formed over wood to produce the appearance of solid metal forms at a fraction of their cost.

105. OIL BURNER

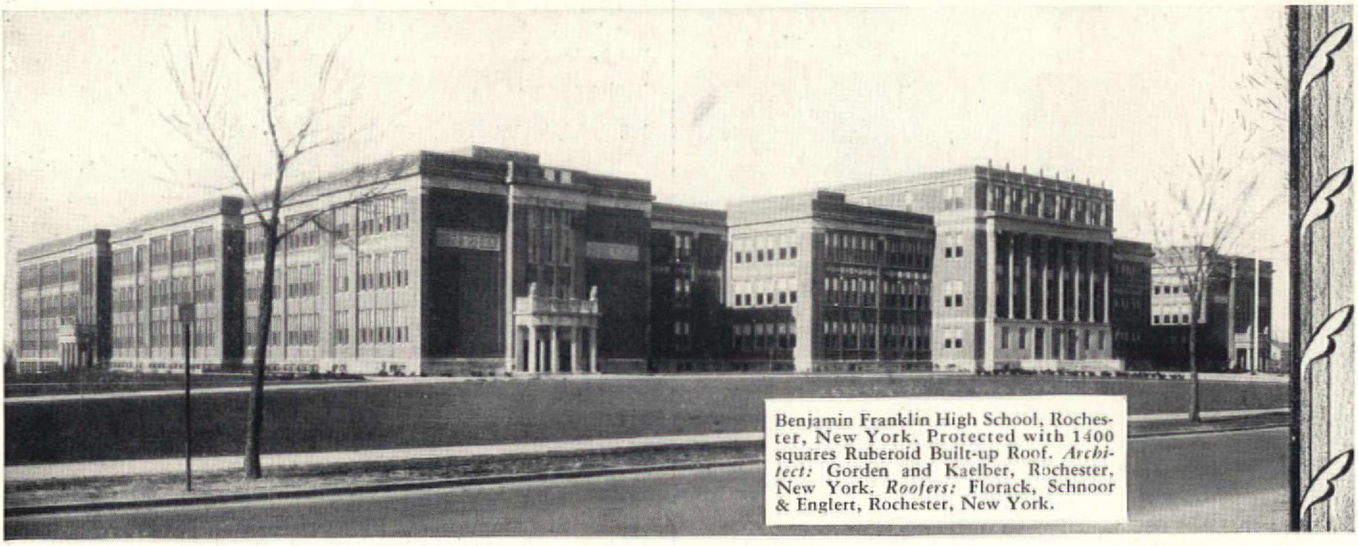
Burnham Boiler Corp. now makes an oil burning boiler with built-in burner as an addition to its regular line. This is an entirely new design made for specific use of oil burning equipment. Everything is built in. Nothing projects outside of the porcelain enamel jacket made of heavy weight steel. This jacket is heavily insulated throughout for both heat and sound. As the oil burner itself is enclosed within this jacket, burner sounds are reduced to a minimum. A hot water heater may be included.

106. KITCHEN SINK

Crane Co. has recently placed on the market its new Sunnyside Cabinet Sink which may be furnished in white or in colors. This sink is 60 in. long of the double drainboard type, 25¼ in. wide with an 8-inch back. The basis is 22x18x18 in. deep furnished with a Utility waste removable cup strainer. Back, drainboards and basin are all in one piece. Below the sink is an enameled iron cabinet presenting an attractive appearance. It can be furnished for either right or left corner installation, free standing or as part of a continuous table top arrangement.

(Continued on page 56)

The Nation's foremost Schools and Colleges *are protected* with RU-BER-OID Built-up Roofs



Benjamin Franklin High School, Rochester, New York. Protected with 1400 squares Ruberoid Built-up Roof. *Architect:* Gorden and Kaelber, Rochester, New York. *Roofers:* Florack, Schnoor & Englert, Rochester, New York.

A Type, Weight, and Finish to fit *every* Condition Imposed

When you draw plans for a school building that requires a built-up roof, let the impressive records of Ruberoid service guide you. Regardless of the conditions imposed, you will find in the thirty RU-BER-OID Built-up Roof specifications the type, weight, and finish to fit your specific needs.

You have a choice of today's most popular types of Built-up Roofs—Asbestos Saturated Felt and Asphalt, Tarred Saturated Rag Felt and Coal Tar Pitch, and Asphalt Saturated Rag Felt and Asphalt—a roof to meet every building requirement and every purse.

For over forty years The Ruberoid Co. has devoted its entire energy to providing quality roofings and building products. How well this company has succeeded may be judged by Ruberoid's constant widening of its line of asbestos and asphalt products and the reception of these products by leading architects and engineers the world over.

When you have a roofing to select, refer to Sweet's or ask for Ruberoid's new Built-up Roofing Specification Catalogue just off the press. It's a sure way to secure the greatest value for your roofing dollar.

RU-BER-OID ARCHITECTURAL PRODUCTS

- BUILT-UP ROOFS
- ASBESTOS SHINGLES
- ASBESTOS SIDINGS
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- ASBESTOS PIPE COVERINGS
- ASPHALT SHINGLES
- WATERPROOF SHEATHINGS
- CEMENT WATERPROOFING

The RUBEROID Co.

ROOFING AND BUILDING PRODUCTS

Executive Offices: 500 FIFTH AVENUE, NEW YORK, N.Y.

BALTIMORE CHICAGO ERIE MILLIS MOBILE NEW YORK

PRODUCTS AND PRACTICE

(Continued from page 54)

107. AIR CONDITIONER

Minneapolis Air Conditioner Co. is now manufacturing the May-Day Humidifier. This is installed close to the furnace in the stack. Hot flue gases pass over special baffle plates and heat the "air conditioning" chamber. Whenever the automatic humidistat in any room indicates that the relative humidity is too low, a fine spray is automatically released, humidifying the cold air taken from the living room. Warmed by this waste heat, washed and humidified in the mixing chamber, this conditioned air is gently circulated by a special fan through the upstairs rooms. Built for long hard use with outside walls of 24-gauge galvaneal steel, this humidifier is designed to fit any type heating plant and sell for a remarkably low price.

108. ILLUMINATION TESTS

Westinghouse Lamp Co. has perfected a simple device for determining lighting intensities. Known as the Westinghouse Light-O-Graph, it consists of a piece of extremely sensitive photographic paper enclosed in a lightproof envelope, colored to a very definite shade. This envelope has ten apertures through which the sensitive paper may be exposed to the light. Before exposure of a light yellow color, this sensitive paper turns darker upon exposure. In $2\frac{1}{2}$ minutes, under the proper lighting intensity, it will turn a shade dark or darker than the color of the envelope. If, in the time, the sensitive paper is still lighter than the envelope, then the lighting is not of sufficient intensity. In connection with this, there may be used a light analyzer. In this, a pin is stuck vertically in the center of a circular disc. When placed on the desk, book, or counter, the pin throws a shadow, and discloses whether or not the light is coming from the proper direction. Shadowed areas on this disc tell the user which direction of light is the correct one.

109. GLASS BLACKBOARDS

N. Y. Silicate Book Slate Co. offers a solution to the blackboard problem in the form of Seloc Glass Blackboards. Among the advantages claimed for this blackboard material is the fact that it may be procured in lengths up to 8 ft. and in widths up to 4 ft. Being made of glass, the color is absolutely uniform. It has a very velvety texture, is completely non-fading, easy to erase on and wash, and impervious to moisture. The manufacturer agrees to bond all installations for a period of 40 years which is considerably longer than the life of many school buildings.

110. NEW WALL SURFACE

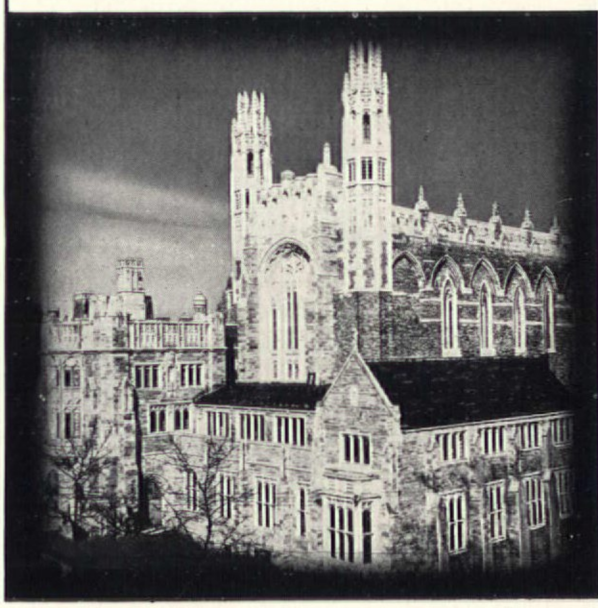
Johns-Manville has recently introduced a new wall surfacing material known as asbestos Flexboard. This is made of asbestos and portland cement, producing a board fireproof and rotproof and yet flexible enough to be applied to considerably curved surfaces. It can be sawed, nailed and applied as easily as wood. It comes in two styles — decorative and standard. Both types are available in plain sheets or scored with lines, forming four-inch squares, to simulate tile. The decorative Flexboard is furnished with a smooth, lustrous wax finish in pastel shades of green, buff, rose or slate. This pigment is mixed with the asbestos and cement during the process of manufacture, making the color an integral part of the board. The standard Flexboard comes unpolished in buff-colored sheets. The decorative Flexboard is suggested as a wall covering in kitchens, bathrooms, corridors, lobbies, show-rooms, restaurants, lavatories, while the standard Flexboard may be used for door casings, baseboards, table tops, recovering old plaster walls and lining farm buildings such as chicken coops, brooder houses and milk houses.

THE

NEW

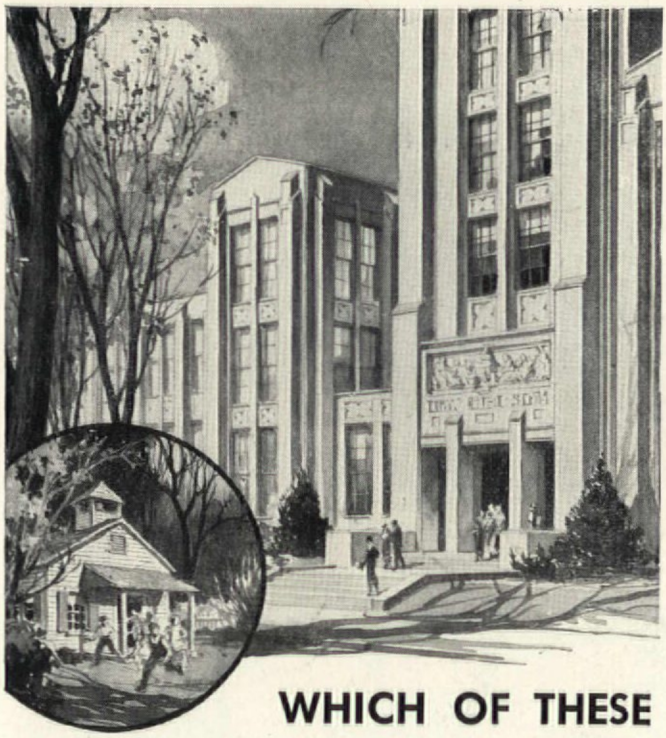
YALE

It would be difficult to find more convincing evidence of the beauty and quality of Sloane-Blabon Linoleum than its selection for the floors of Sterling Memorial Library, Sterling Law School and the Yale Theatre—three notable contributions to Yale's current $60,000,000 Gothic transformation.



Colorful, resilient, sound-absorbing and sanitary, Sloane-Blabon Linoleum is an ideal floor-covering not only for "public" buildings but for the home. For facts pertaining to Sloane-Blabon Linoleum, write for our "Linoleum Handbook." W. & J. Sloane Selling Agents, Inc., 577 Fifth Avenue, New York.

SLOANE-BLABON LINOLEUM



MANUFACTURERS' PUBLICATIONS

Among the manufacturers' publications recently received of interest to the architectural profession were the following:

111. AUTOMATIC VALVES

From the Chapman Valve Manufacturing Co., a new catalogue illustrating and describing in great detail their line of Automatic Cone Valves and Controls.

112. QUIETILE

A new catalogue from the United States Gypsum Co., describing and illustrating Quietile, a sound-absorbing tile furnished in various colors. Also, a catalogue describing the same Company's Red Top Metal Lath Resilient System for sound-resisting construction.

113. EXTERIOR LIGHTING FIXTURES

A new, profusely illustrated catalogue of the Smyser-Royer Co., showing their entire line of exterior lamps for street and building lighting.

114. GLASS SHOP FRONTS

A new catalogue from the Pittsburgh Plate Glass Co., illustrating the many uses of glass for modern shop fronts, together with technical data. Also, a catalogue from the same company, illustrating the uses of glass for bathrooms and kitchens.

115. WALL COVERINGS

A new sample book price list on Sanitas from the Standard Textile Products Co., illustrating in color and with samples their complete line of washable wall coverings.

116. GREENHOUSES

From the Lord & Burnham Co., a new greenhouse book especially prepared for architects, showing many different types of greenhouses and their uses.

117. METAL WALL TILE

A new catalogue from the Youngstown Pressed Steel Co., illustrating and describing Veos vitreous enameled stamped steel wall tile for bathrooms. Also, a list and illustrations of special bathroom fittings for use with this tile.

118. HARDWOOD

A brochure from the Appalachian Hardwood Manufacturers, Inc., listing various hardwoods, their uses, properties, and suggested methods of specification.

119. PUBLIC ADDRESS SYSTEM

Greater educational facilities are completely described and illustrated in the latest catalogue, A.I.A. File Number 31i7, of the Western Electric Co.

REQUEST FOR DATA

To obtain any of the publications reviewed on these pages, indicate the number and send coupon to THE ARCHITECTURAL FORUM, 220 East 42nd St., New York.

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250

MODERN BOSTON SCHOOLS NOW

"CELESTIALITED"

One of the recent CELESTIALITE installations

JEREMIAH E. BURKE HIGH SCHOOL for GIRLS—BOSTON
Dept. of School Bldgs.—Eugene McCarthy, Head of Electrical Division
Architect—George Ernest Robinson, 80 Federal Street, Boston, Mass.

. . . Man's Nearest Approach to Daylight

• For fifteen years the progressive school board of Boston has insisted on the distinctive "next-to-daylight" qualities of Celestialite for lighting their up-to-date schools.

This three-layer glass is the *only one* capable of producing lighting free from glare, when used in conjunction with the high-wattages necessary to produce the foot-candle intensities now recommended by lighting engineers.

CELESTIALITE'S
Three Layers

[1] A layer of crystal-clear transparency — for body and strength.

[2] A layer of white glass — to diffuse the rays and soften the light.

[3] A layer of blue glass — to whiten and improve the quality of the light.

•

CELESTIALITE
(Registered and Patented)
"Next-to-Daylight"

GLEASON-TIEBOUT GLASS CO.
200 FIFTH AVENUE • NEW YORK
Celestialite Division

An Outstanding
NEW YORK HOTEL

» » » At The Delmonico gentlefolk are assured of the unobtrusive service and quiet taste that they are accustomed to enjoy within their own homes.

Single Rooms from $4 a day
Double Rooms from $6 a day
Suites from $8 a day

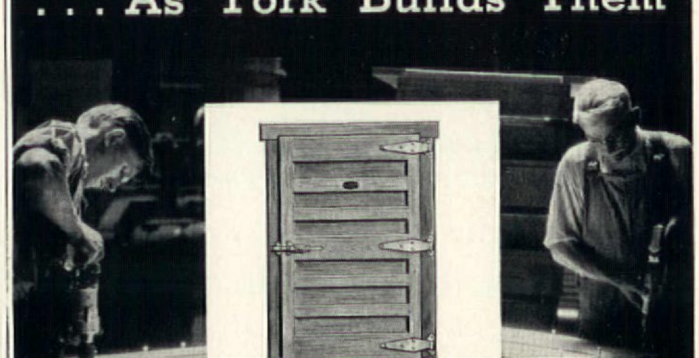
A DISTINGUISHED RESTAURANT

HOTEL
DELMONICO

UNDER RELIANCE DIRECTION

Park Avenue at 59th Street
NEW YORK

COLD STORAGE DOORS
. . . As York Builds Them

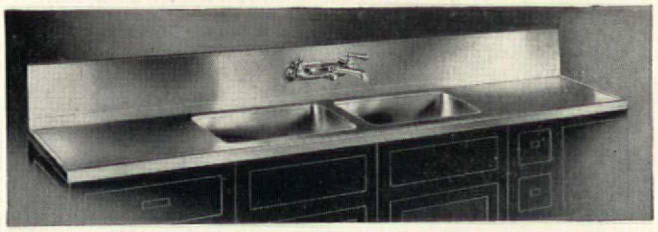


...patented "corkboard dip seal"...extra heavy steel-angle corner reinforcement ...superior diagonal bracing...carefully selected, well seasoned wood...rugged hardware with easily operated straight-pull latch. Send for descriptive booklet.

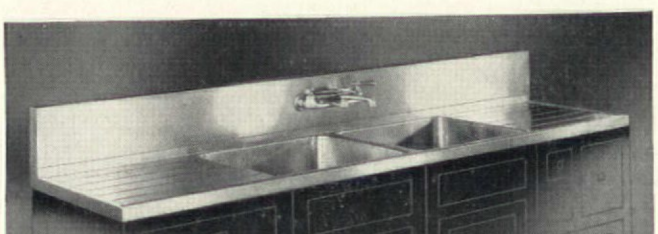
York Ice Machinery Corporation, York, Pennsylvania
Send booklet describing York Cold Storage Doors

Name________________
Street________________
City________ State________

Prices Slashed UP TO 35%



"Straitline" Monel Metal Cabinet Sink (25" deep). Available with single or double bowls, single or double drainboards, and in lengths from 48" to 120", with either 1½" or 8" back splash.

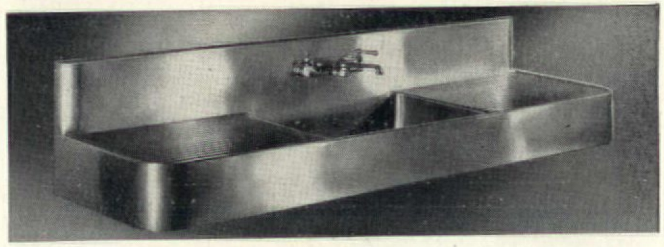


"Straitline" Monel Metal Cabinet Sink (21" deep). Available with single or double bowls, single or double drainboards, and in lengths from 41" to 82", with either 1½" or 8" back splash.

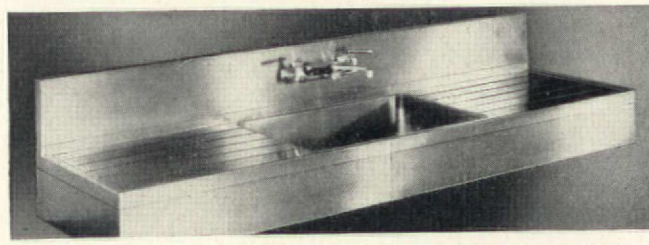
"Straitline" Monel Metal Cabinet Sink, 25" x 60", with 8" back splash, complete with 60" steel base cabinet. Price, with crumb cup strainer but without faucet, $105.50. Same Sink-and-Cabinet Unit, with 1½" back (without faucet), only $99.50.

This Special Sink-and-Cabinet Unit NOW ONLY **$105.50**

With 1½" back, *ONLY* **$99.50**



"Streamline" Monel Metal Kitchen Sink. Also available with single drainboard with or without corner splash, and in lengths 41" to 72".



"Straitline" Monel Metal Kitchen Sink. Available with single or double bowls, single or double drainboards, and in lengths from 41" to 82" with either 1½" or 8" back splash.

Prices on all standardized Monel Metal Sinks and Cabinet Tops are cut in proportion . . . that's cooperation with the N.H.A.!

IN the Federal government's drive for an immediate program of modernizing, here's real and practical cooperation:

Prices on ALL Monel Metal sinks and cabinet tops are slashed! The figures quoted on the Sink-and-Cabinet model shown above are typical of new prices for the whole line.

These big reductions are all on *standardized* INCO models. No changes in specifications. No cheapening in quality. Instead, the same weights and finish, the same careful workmanship.

Now, with prices so low, and with 57 models of standardized sinks and cabinet tops, you have every incentive to include Monel Metal whenever you plan a modern kitchen.

A complete all-Monel Metal kitchen is a grand sight . . . even after years of use. Monel Metal is rust-proof, strong as steel, resistant to corrosion and easy to clean. Being a *solid* metal, it never chips, cracks, peels or "wears off."

Send for the new catalog and list of latest prices of "INCO Standardized Monel Metal Sinks and Cabinet Tops." Included are plan and sectional drawings of all models and convenient tables of dimensions. Address your inquiry to our national distributors, the Whitehead Metal Products Company, 304 Hudson Street, New York, N. Y.

THE INTERNATIONAL NICKEL COMPANY, INC.
67 WALL STREET NEW YORK, N. Y.

Monel Metal is a registered trade-mark applied to an alloy containing approximately two-thirds Nickel and one-third copper. Monel Metal is mined, smelted, refined, rolled and marketed solely by International Nickel.

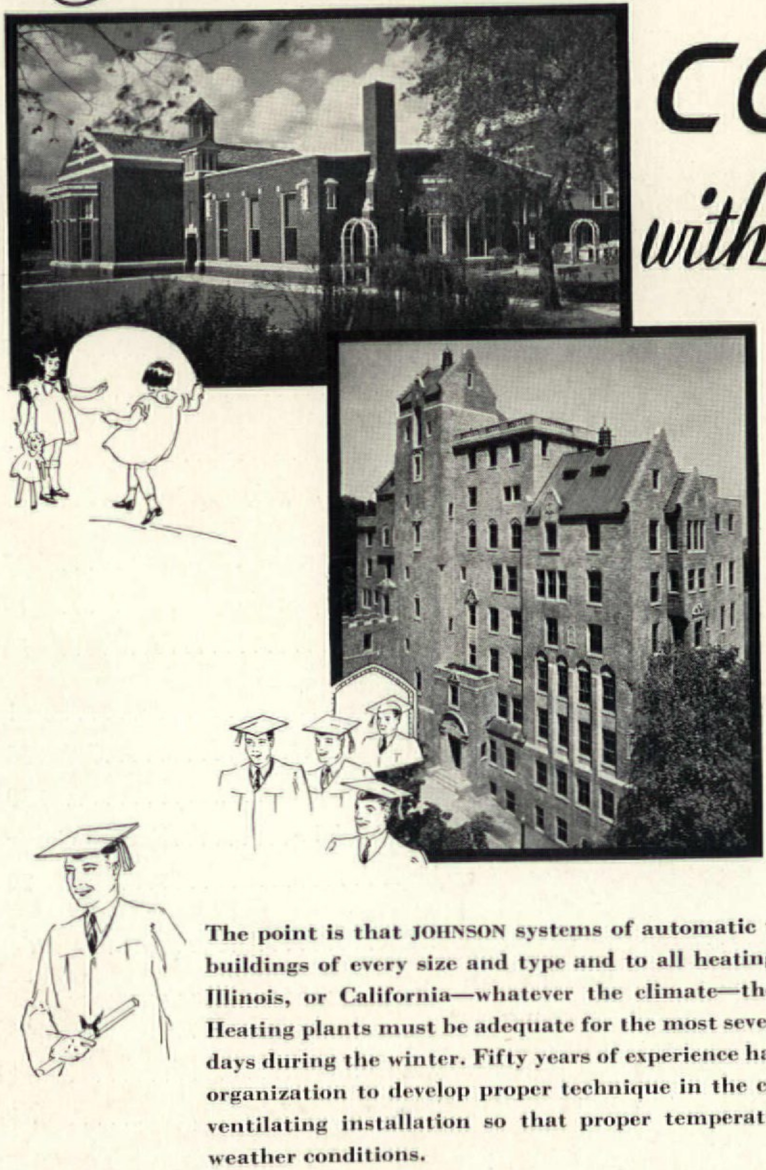
INCO MONEL METAL

NRA CODE

Monel Metal

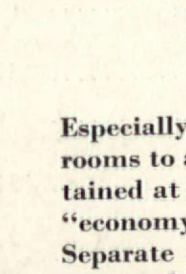
ADVERTISING INDEX

From KINDERGARTEN *through* COLLEGE *with* JOHNSON REGULATION



At left, above: Kindergarten Unit, Oakton School, District 76, Evanston, Illinois. Childs & Smith, architects.

Below: Neurological Institute, McGill University, Montreal, Quebec. Ross & Macdonald, architects; McDougall & Friedman, engineers.



The point is that JOHNSON systems of automatic temperature control are adapted to buildings of every size and type and to all heating and ventilating schemes. Quebec, Illinois, or California—whatever the climate—the problem is essentially the same. Heating plants must be adequate for the most severe weather, encountered on very few days during the winter. Fifty years of experience have made it possible for the JOHNSON organization to develop proper technique in the control of every type of heating and ventilating installation so that proper temperatures will be maintained under *all* weather conditions.

Especially desirable in school buildings is JOHNSON *Dual Control* which allows heating occupied rooms to a "normal," 70 degree temperature while unused sections of the building are maintained at 50 degrees. At night, the entire building is carried at the reduced temperature, an "economy level" from which it is neither difficult nor expensive to re-heat in the morning. Separate steam mains are not required. The *Dual Thermostats* are connected in groups arranged in such a way that rooms used during evening hours, or at other odd times, may be handled separately. Switches at a central location select the normal "occupancy" temperature or the reduced "economy" temperature for the thermostats in each group. Single rooms may be cut from the group operation by means of a push button on each thermostat, furnished in those cases where such flexibility is desirable.

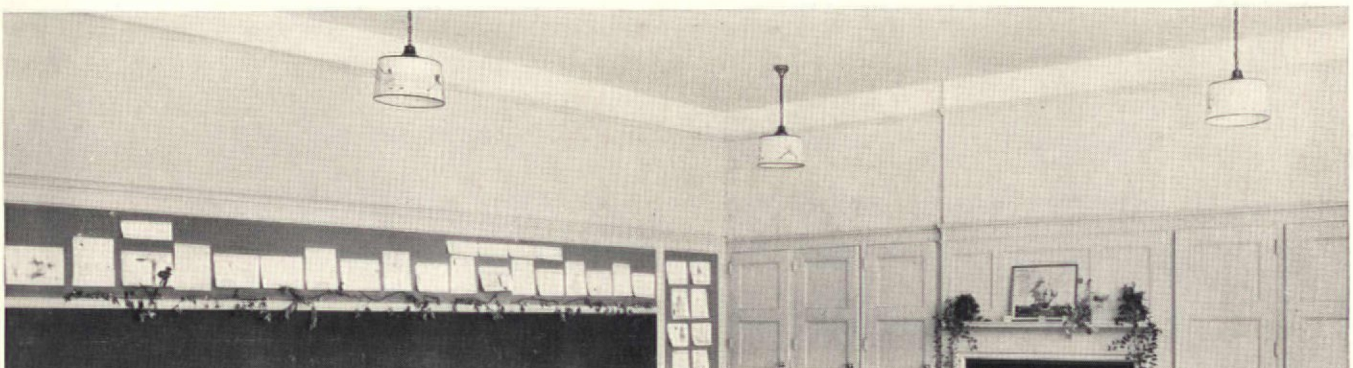
SINCE 1885 **JOHNSON SERVICE COMPANY**

MILWAUKEE, WIS., AND PRINCIPAL CITIES

NRA MEMBER U.S. WE DO OUR PART

JOHNSON AUTOMATIC HEAT & HUMIDITY CONTROL

for *Individual Rooms* · · · for *Air Conditioning* · · · for *Heating Zones*



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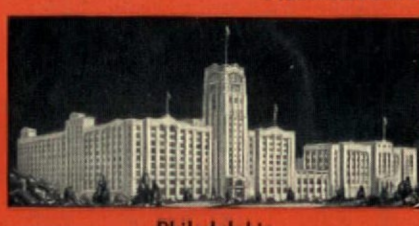

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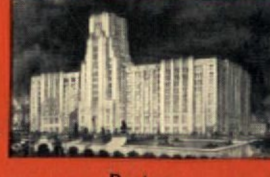

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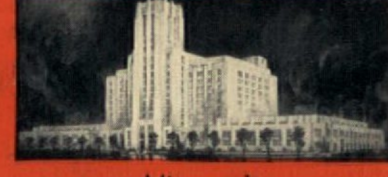

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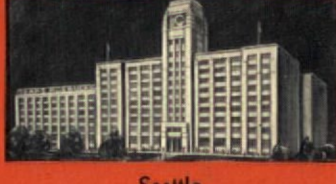

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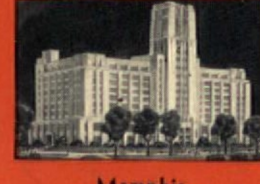

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